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The Busy Man

By RUFUS T. STROHM

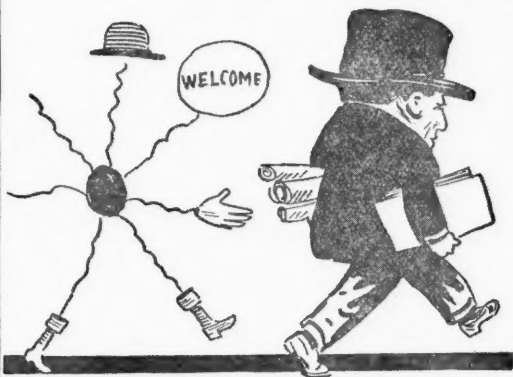


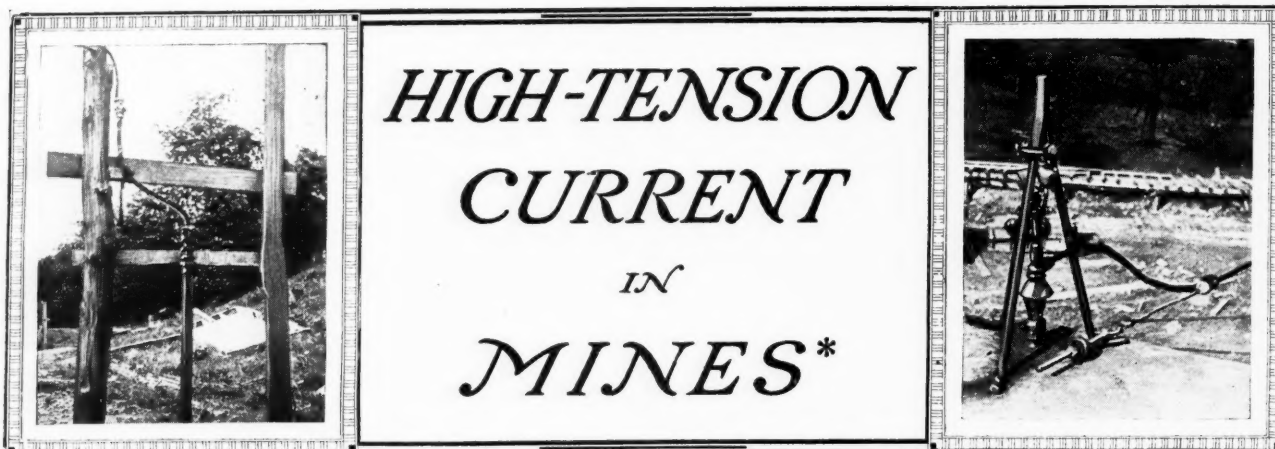
HE rushes madly up and down, his brows contracted in a frown, and in his set, far-seeing eyes a look of contemplation lies, as though behind that studied glance he fought with fact and circumstance, and battled in his seething brain some mighty victory to gain. One hand grasps twenty sheets or more of paper thickly written o'er; the other has a strangle hold on yards of blueprints tightly rolled. His head is bent, his shoulders bowed beneath a weighty mental load; and thoughtless folks are apt to say, "He's busy as a bee today."

His rapid movements seem to cry "Behold, how diligent am I!" But say, he's pulling ancient stuff colloquially known as "bluff." Those pages held with wire clips, those blueprints he so firmly grips, are part and parcel of the scheme to make his clever acting seem more nearly like the real thing and give the fake an honest ring.

A water spider on a pond is most exceptionally fond of doing acrobatic stunts and being everywhere at once. It ambulates with wondrous grace and dances all around the place; it does a giddy, wanton glide that sends the ripples spreading wide; it curvets, capers, spins and whisks; in fancy whirls and turns it frisks; but yet it never gets beyond the narrow limits of the pond.

And so this chap who seldom sits, and all around the office flits, is pulling wool across the eyes of those who aren't very wise; but other folks, more keen and bright, can classify the man aright. His actions, insincere and smug, proclaim the human water bug!





SYNOPSIS—*High voltage for mines is any voltage above 650 volts. The usual voltage at which alternating current is distributed underground is 2200 volts. With such circuits the insulation must be more perfect than with lower voltages. High-tension currents, if properly installed, are not dangerous to underground workers. Stations should be set ahead of the load center so as to anticipate future power requirements.*

IN A RECENT technical paper of the Bureau of Mines a tension of 300 volts or less is termed "low"; greater than 300 and up to 650 "medium"; above 650 "high." This article on "High-Tension Current in Mines" will therefore be a discussion of electrical systems operating with voltages above 650 volts. The peculiar conditions existing in mines make necessary the use of "low" or "medium" voltages for haulage and other portable motors. Moreover, if we are trying to live up to the spirit of "safety first," only voltages of 300 or less, such as are described by the Bureau of Mines as "low," should, except in special cases, be used for haulage or portable machines.

With "low" voltage the distance that electric current can be transmitted without excessive loss or a serious reduction in voltage is limited. As the current is inversely proportional to the voltage for a given connected load and the losses are proportional to the square of the current, it is easy to show marked savings by the use of the higher transmission voltages. These savings show up in the amount of copper required in the circuit, the size of coal pile, the output of the machines and the cost for the maintenance of the motors.

Reduced voltage causes motors to operate at low efficiency and at underload and underspeed. With reduced voltage the current is increased, and as the heating is proportional to the square of the current, the motor soon overheats and burns out, causing high repair charges and rendering the equipment unproductive for many hours. With reduced voltage at a cutting machine the lineal feet of coal per shift falls off and the motor makes frequent trips to the repair

shop. With reduced voltage the haulage motor hauls fewer cars per trip or makes fewer trips per shift and is often out of service for repairs.

It is not possible to state a rule for finding the economical limit of distance for "low"-voltage transmission because it will vary with the nature of the connected load. A mine that cuts and hauls on the same shift has a very different transmission problem from one that cuts on one shift and hauls on another. The nature and development of the mine also have a very definite bearing, so that the only way to determine the economic value of a given electrical system is to figure it out for any mine in question.

It may be easy to show that the losses are much reduced as the voltage is increased, but on a given property the cost of producing, insulating and transforming the higher voltage may more than offset the saving due to reduced losses. High voltage should be considered only in alternating current, as it does not appear practical to use high-voltage direct current for mining.

Where power is purchased or where a central station serves several mines, there can be little question but that the high-tension alternating-current transmis-

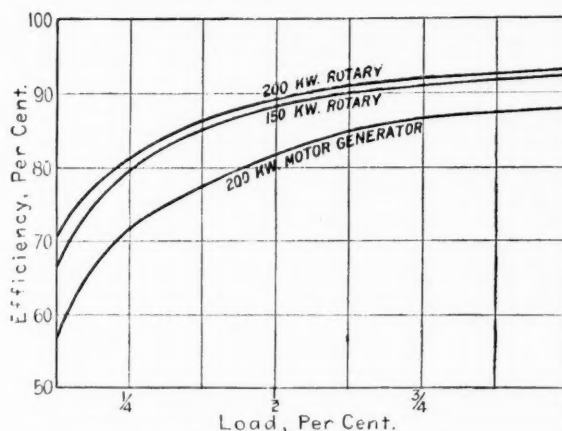


FIG. 1. RECENT SIX-PHASE INTERPOLE ROTARIES ARE MORE EFFICIENT THAN MOTOR GENERATORS

sion system is the one to use, but beyond this it is impossible to make a broad statement. Assuming a high-tension supply to the mine, the next step is to determine what to use inside the mine. At the present state of development alternating current should not be considered for haulage motors, and if electric haul-

*Paper read by J. Roland Brown before the Kentucky Mining Institute at Lexington, Ky., May 18, 1917.

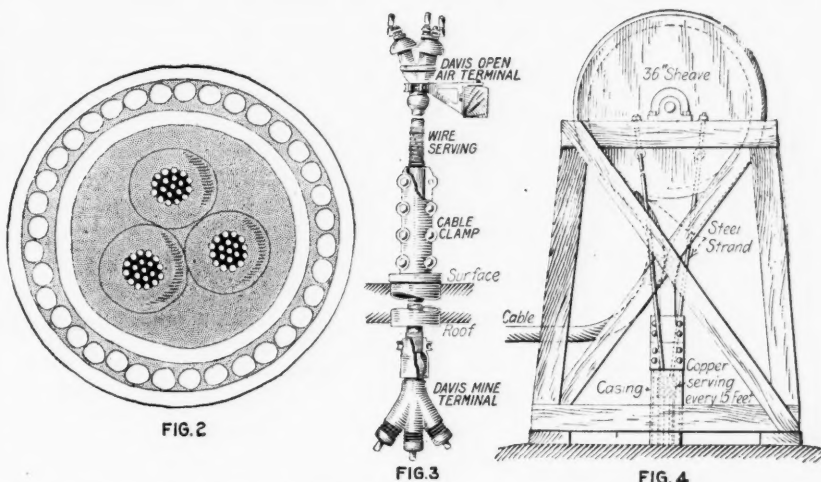
age locomotives are used with a trolley, 250-volt direct current may be furnished by converting the high-tension alternating current through a rotary converter or motor-generator set. Cutting machines and portable pumps can be operated either by direct current from the haulage circuit or by "low"-voltage alternating current, induction motors being used. The "low" voltage three-phase alternating-current circuit is connected through a bank of three transformers to the high-tension system. The three-phase induction motor is more rugged and freer from troubles than the direct-current motor as it has no commutator or brushes and will "quit" when overloaded or subjected to a reduced voltage and so is not likely to be burned out like a direct-current motor. This feature of the induction motor of not operating when the voltage has dropped is really more of an advantage than a fault as it demands better voltage regulation which in turn means efficiency and increased production.

For the fans and hoists "high"-voltage alternating current of 2200 volts can be used economically without special transformers. For tippie motors and for operating the shop, "low"-voltage alternating-current induction motors served by a bank of transformers will give good service. All permanent lighting circuits can be furnished with "low"-voltage alternating current through transformers. Temporary light circuits in the mine may be connected with the haulage circuit.

For a new development it is often the best policy to purchase power and install the transformers above ground and lower a low-voltage three-wire cable to the mine through a borehole to feed three-phase induction motors on the cutting machine. Such a scheme gives good results at a minimum cost of equipment where the mine has not been developed to a degree making electric haulage necessary.

For a mine of moderate size, where the distance from the power house or substation to the most distant load is not great, it would hardly prove profitable to use high-tension alternating current in the mine. For a large development the use of high-tension al-

ternating current will probably be most economical. If the power is purchased from a distant power house, 33,000-volt current will probably be delivered to a



FIGS. 2 TO 4. SECTION OF BOREHOLE CABLE, MOUNTING FOR CABLE AND METHOD OF HOLDING CABLE

substation where it will be transformed to 2200 volts. The 33,000-volt line must be equipped with disconnecting switches and electrolytic lightning arresters, and if the 2200-volt secondary circuit passes outside the substation above ground, it must be equipped with lightning arresters. It is best, however, to carry this secondary circuit underground in a three-wire lead-covered or armored cable.

When high-tension power is generated at the mine, the voltage is usually 2200 volts. Where power is purchased, an extra independent transmission line should be connected up, capable of operating the fan at not less than half-speed and of running the hoist under reduced load so that the men can be safely drawn from the mine should an accident on the main line temporarily shut off the current.

In lieu of this, oil engines may be installed to meet such emergencies. Where power is generated at the mine, the hoist and fan should be operated by steam engines, or else steam units should be installed that can be used as reserves in case of necessity.

For mines already equipped with direct-current cutting and haulage motors but changing to purchased power and alternating-current supply, the entire load under-

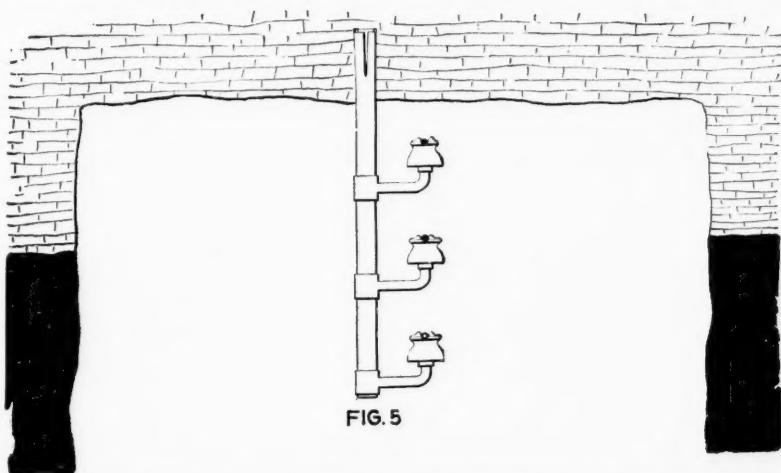


FIG. 5

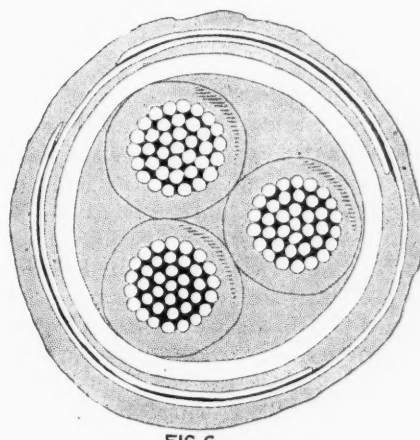


FIG. 6

FIGS. 5 AND 6. THREE-WIRE SUPPORT IN AIRWAY AND INSULATED TRANSMISSION CABLE

ground should be supplied through rotary converters or motor-generator sets. The question then is whether the converters are to be placed outside the mine or underground. Where the load can readily be handled by one machine, it should be placed outside, but where two or more machines will show economy, then they should be placed inside and carefully located so as to give the best load distribution. In the latter case it will be necessary to carry 2200-volt alternating current underground.

It is now considered good practice to use several converters connected in parallel on the direct-current side and operated without continuous attendance. By using an automatic reclosing circuit-breaker on the direct-current side and introducing a time element into the switch on the alternating-current side, an attendant for closing the feeder breakers upon short-circuit or overload is not necessary and practically automatic operation is secured. The converters are inspected, oiled, cleaned and adjusted when started on a shift and again when closed down, and at all other times the door is locked.

As shown by the curves in Fig. 1, the latest designs of six-phase interpole rotary converters with their attendant transformers will give higher efficiency than a synchronous motor-generator set, and as a synchronous converter will carry a momentary overload about twice that of a synchronous motor-generator, it is possible to use a smaller unit, which even with the necessary transformers will cost less than the equivalent motor set. In nearly all cases of mine load the peak determines the capacity of the machine, so this overload feature of the converter is important.

The motor set would give the best power-factor correction if it were possible to make adjustments for load variation, but this is rarely done, and when it is not, the rotary converter can be made to give an average power factor higher than that of the motor set.

WELL-INSTALLED 2200-VOLT CIRCUIT IS SAFE

On an installation for a larger mine the 2200-volt three-phase alternating current circuit is carried underground. There rotary converters are connected to supply power for the haulage, and transformer stations, distributed at load centers, supply the "low"-voltage alternating-current induction motors on the cutting machines and pumps. This makes a satisfactory and efficient system of distribution when conditions are right for its installation.

A 2200-volt circuit can be introduced into a mine with perfect safety if it is properly done. With "low" voltage it is possible to keep the motors turning with poorly installed circuits, but with "high" tension only the best work and design will give any service whatever. It pays even with "low" voltage to make high-class installations but with "high" voltage it not only pays but is absolutely essential.

For some mines where the rotaries for the haulage system are on the surface, it is best to carry the 2200-volt circuit for the cutting machines above ground and enter through a borehole located at the center of the cutting-machine load, transformers being installed at the bottom of the borehole. For all 2200-volt three-phase circuits entering the mine, it is best to use a three-wire cable insulated for twice the voltage, or

generally 5000 volts. The insulation which has sufficient mechanical strength and does not deteriorate and is not high in cost is varnished cambric. This insulation is protected from moisture and injury by a lead sheath about $\frac{1}{4}$ -in. thick. For borehole cable the lead

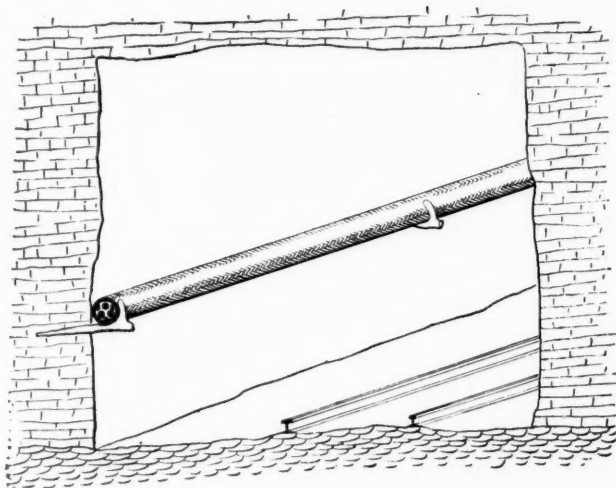


FIG. 7. CABLES SUPPORTED BY HANGERS TO RIB

sheath is covered with jute and compound. A layer of steel wire (see Fig. 2) is then wound with a slight twist around this, and another covering of jute and compound surrounds the whole. The steel wires act as an armor and also carry the weight of the cable. At intervals of about 20 ft. these steel wires are served with wire to hold them in place and make them grip the lead sheath. A good mounting for a "high"-tension borehole cable is shown in Fig. 3. Fig. 4 shows a method of holding a heavy borehole cable using two steel strands served to the outside of the cable every 15 ft. and carrying the mechanical load which might be too much for the standard cable.

"Low"- or "medium"-voltage cables entering boreholes have the same mechanical difficulties to overcome, but of course, need not have insulation of equal resistance. A cable entering through a deep shaft must meet the same mechanical loads as one entering through a borehole. Boreholes with cables for the electrification of the mines under them are shown in the title at the head of the article.

Bare wire circuits carrying 2300-volt three-phase alternating current have been installed in air-courses, the circuit being supported on porcelain insulators. This of course is a cheap installation, but it does not offer the safety afforded by an armored cable. (Fig. 5.)

The best plan is to use a three-wire armored cable (Fig. 6), which has a steel tape wound over the lead sheath and covered with jute and compound. It should either be laid in a trench or carried by hangers let into the rib. All cables should be large enough to carry continuously twice the working voltage. The lead sheath and armor of all cables must be grounded effectively. Before installing cable feeders, whether buried in the floor or supported on the rib or from the roof, they should be located on a map kept expressly for this purpose. After installation, an inspection should be made, and the map should be checked to be sure it is correct. Cables carried on the rib should hang about two or three feet from the floor and must have

steel armor. When so installed, they will rarely be injured by falls. When installed in a trench, they should be drawn through a pipe or duct laid in concrete, provided with small manholes every 300 to 500 ft. so that in case of trouble only that amount of cable need be removed.

These manholes should be spotted so that all splices and branches are located in them. In making splices and branches in cables, a much better grade of work must be done than is usual on mine circuits. The individual wires of the cable must be carefully spliced, soldered and insulated. The group of wires must then be inclosed in a lead sleeve, the joints wiped and the sleeve filled with compound—a careful job, but well worth doing thoroughly. With careful installation the "high"-voltage circuit can be operated with entire safety and few or no interruptions.

Converter or transformer stations in the mine should be installed with care and according to plans and drawings. Placing transformers where most convenient without first making a careful investigation of the load is bad practice and will not give good results. The converter or transformer room should be closed to all persons except those authorized to care for or repair the apparatus and must offer such protection that an ignorant person, even one who disobeys rules, cannot be injured by the current.

TRANSFORMER ROOM SHOULD BE FIREPROOF

Some mines have used a wood lattice with locked door to protect transformers, but it is much better to build a fireproof room. The room may be made with concrete or brick walls, floor and roof, and provided with a locked iron door with ample openings for ventilation. The door sill should be raised a sufficient height above the floor to keep the transformer oil from flowing out into the mine in case of an explosion in one or more transformers. The transformers should be raised so that they may easily be drained.

A bucket of clean dry sand should be placed in each room for fire fighting, and one, or better two, Pyrene, or similar, fire extinguishers, suitable for extinguishing oil or electric fires, should be mounted on the outer wall near the door.

The "high"-voltage armored cable should enter the

room through the wall or floor and connect with the high-tension oil switches, and fuses mounted on the inside face of the wall. Where there are few stations, the cost may be lowered by having only fuses and no switches on the high-tension side of the transformers, but this requires cutting out the main feed to work on one transformer station.

Three transformers are required on a three-phase circuit and are connected in delta. With this arrangement one transformer may fail and be cut out without interrupting the service, which will be taken care of by the other two.

In some mines the transformers are wound for 2200 volts primary and 250 volts secondary, but as alternating current cutting-machine motors will not operate under a greatly reduced voltage, some transformers are wound with two secondary taps, one for 240 volts and one for 275 volts. When the machines are cutting near the station, the 240-volt tap is used, but when the distance to the machines is great enough to cause a serious voltage drop, then the other tap is connected.

The secondary or low-voltage feeders pass through the wall of the room to oil circuit-breaker switches, mounted on the outside where the circuit can be controlled without entering the room. Three-wire low-voltage cables are then carried to the cutting face. Cutting-machine cables may then be attached to the feeder cables by spring connectors, and as the machines advance these tapping points may be reinsulated.

To secure all the benefits from the use of high-voltage alternating current, it is essential to keep a map of all circuits and by careful records and tests change the stations from time to time so that they are near the center of their load. It is necessary, therefore, to anticipate the load center and place a station beyond it, thus preventing too frequent changes. High-voltage alternating-current circuits and apparatus are now in successful operation in many mines, and those who operate them seem well satisfied with the results and state that they would install alternating current again when developing new work.

The safety problem has been solved and now depends on careful installation; and the economy of the system depends largely upon the skill and planning of the electrical engineer.

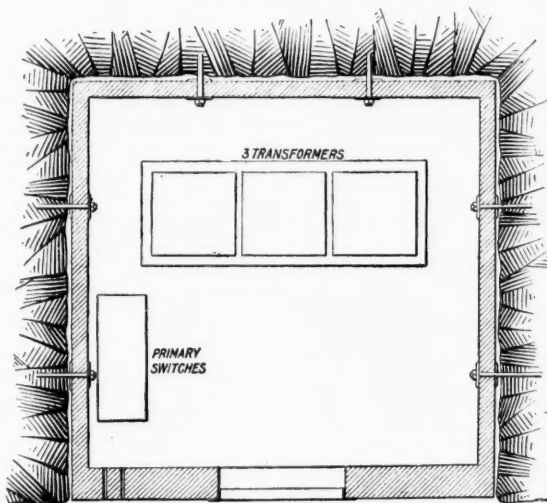


FIG. 8

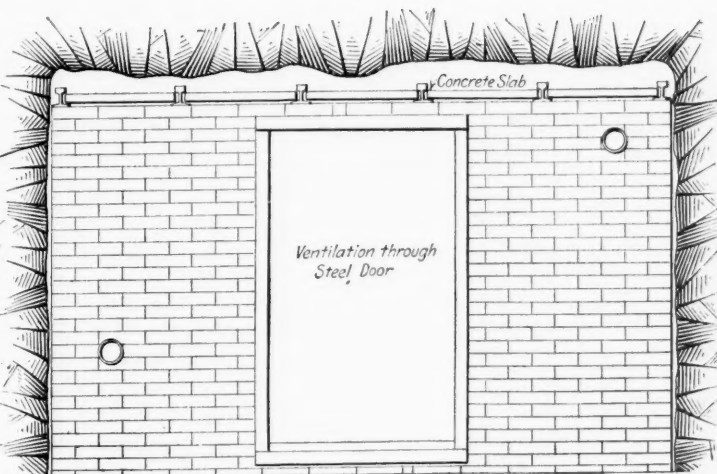


FIG. 9

FIGS. 8 AND 9. PLAN AND ELEVATION OF AN UNDERGROUND TRANSFORMER ROOM

Location and Construction of Mine Tracks—IV

By J. McCRYSTLE

Minersville, Penn.

SYNOPSIS—*Grades in mine tracks are necessary in order to equalize the drawbar pull in both directions, to secure adequate track drainage and under certain circumstances to facilitate handling of the cars. On curves grades are introduced to compensate curve resistance. Such compensating grades may be either positive or negative.*

IN railroad work the number of feet of rise or fall per unit of distance is called the grade; the number of feet of rise or fall per 100 ft. horizontal, the per cent. of grade.

On the surface the grade for locomotive traffic is determined, first, by the size of the locomotive and the number of cars it is required to haul; second, by the elevation it is desired to attain in a certain distance; and third, by the topography of the route.

Underground, where the headings are driven on line, the grade follows the pitch of the heading, rope haulage and planes being introduced when the grade becomes too heavy for locomotive traffic.

On the heavier pitching measures the gangways are usually driven on a regular grade, which follows the strike of the bed. In determining this grade, the drainage, haulage, and to a certain extent the loading of the cars, should be considered.

In lightly pitching or rolling measures, before any lines for headings or chambers are adopted, the probable contours of the bed should be shown in advance of the workings, so that an idea of the grade that is likely to be encountered may be formed. A study of the contours and close attention to the grade as the heading advances will serve to forestall using the heavier grades requiring rope haulage or the employment of other forms of haulage than locomotives or mules.

A specific grade cannot be adhered to rigidly in the light pitching or so-called flat measures, but nevertheless more attention should be given to approximating this grade. Too often the workings are projected with very little consideration toward anything other than releasing a certain area of coal, the lines being followed regardless of the grade. This entails high transportation costs. A combination of the line and contour method, while affording a less symmetrical layout, secures a more economic haulage.

A good rule, applicable in many cases where headings are driven by alignment, is to first determine the lines as far as practicable to conform with both the area to be worked and the best possible grade, then to establish a *maximum* grade and give each line with the understanding that this line shall be followed only so long as the inclination of the strata does not compel exceeding this grade. Should this inclination be encountered, further advices can be then given, based on the latest developments, before the heading is continued.

In the determination of a standard gangway grade for the gangways in the heavier pitching beds, the first requisite should be that the grade be sufficient to

take care of the drainage and allow the water to maintain its channel free from any accumulations of silt or sediment. Good drainage is a requirement in any type of haulage, and in the maintenance of the ballast and trackwork it is a necessity.

A ditch with a semicircular cross-section will have the greatest carrying capacity, while one with a half-hexagon cross-section is the nearest practical approach thereto for mine work.

The following is an approximation of Cutters' formula for ditches,

$$V = -\sqrt{\frac{100,000r^2s}{8r + 15}}$$

in which

V = Mean velocity per second;

r = Hydraulic radius; that is, the cross-section of the water in the ditch in feet, divided by the perimeter of the ditch in contact with the water;

s = The slope; that is, the fall divided by the length.

The following table shows the carrying capacity and mean velocity for a ditch with a half-hexagon cross-section per foot of bottom width. (See Fig. 9.)

Grade per 100 Feet	Mean Velocity in Feet per Second	Cubic Feet per Second	Cubic Feet per Minute	Gallons per Minute
4 in.	1.84	2.39	143.5	1,075
6 in.	2.25	2.92	175.5	1,315
8 in.	2.60	3.38	202.5	1,520
10 in.	2.90	3.78	226.8	1,700
12 in.	3.19	4.14	248.4	1,863

A wide, shallow ditch with the same cross-sectional area and grade will have less current velocity, will carry less water, and will choke up much more easily than one of a narrower and deeper form. The velocity should not be less than $1\frac{1}{2}$ ft. per second, or the suspended particles will deposit along the bottom of the ditch.

Where drainage is not the prime consideration, a theoretic grade can be computed, whereby the slope of the

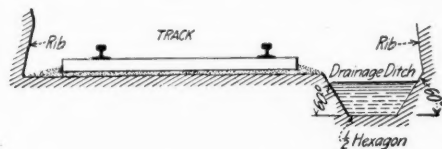


FIG. 9. PRACTICAL DRAINAGE DITCH

road in favor of the loaded cars will compensate for the extra resistance due to the additional weight. In other words, a proper utilization of the grade will allow the drawbar pull on a trip of loaded cars to equal that of an equal number of empty cars. The motor or mules will thus be able to pull as many cars from the face loaded as were brought in empty.

The prevailing grade in mines where it is possible to establish a grade with no consideration but that of haulage runs from 4 in. to 6 in. per 100 ft.; that is, a 0.33 per cent. and 0.5 per cent. grade respectively. Within the last few years it has been realized that this grade is rather too light unless some type of anti-friction bearing is used. Accordingly, many companies have

fixed their standard gangway grade at from 6 in. to 10 in. per 100 feet.

It is obvious that the greater the difference in weight between an empty and loaded car, the steeper should be

which multiplied by 100 will give the rise in 100 ft., which is 0.443 ft., or 5¼ inches.

On straight track, with 5¼-in. grade per 100 ft. in favor of the load, a mule would be able to pull as many

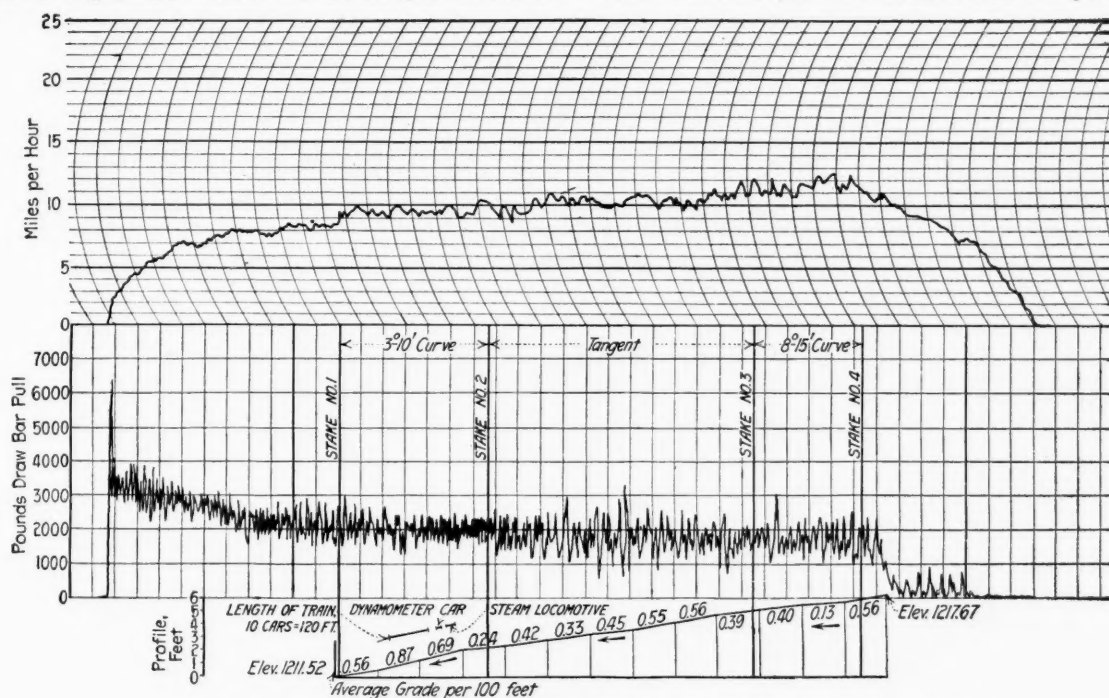


FIG. 10. DYNAMOMETER RECORD CHART OF PLAIN-BEARING CAR TRIP

the grade in favor of the load to overcome the greater resistance due to the load.

The amount of track resistance is almost proportional to the weight on the rails, and as the modern practice has been to enlarge the capacities of cars, the grade should likewise be augmented following any increase in car loading; or the additional resistance from the increased load should be overcome by reducing the journal friction by an improvement in the bearings.

The following example will illustrate the usual method of computing the theoretic grade which will equalize the drawbar pull on empty and loaded cars.

Example: A certain colliery has in use all-steel cars weighing empty 5080 lb. each and loaded with coal an average of 12,230 lb. As the track is dirty and not very well laid, the total frictional resistance will be assumed as 30 lb. per ton for an empty car and 25 lb. per ton on a loaded car; in other words, the coefficient of friction (or ratio of the resistance to the weight) will be 0.015 and 0.0125 respectively. It is desired to find the grade that will equalize the draw-bar pull on an empty car with a loaded car. Let

ϕ = The sine of the angle of the desired grade;

W = Weight of empty car;

W' = Weight of loaded car;

C = Coefficient of friction for empty car;

C' = Coefficient of friction for loaded car;

then

$$(WC) + W \sin \phi = (W'C') - W' \sin \phi$$

Substituting values in the above case,

$$(5080 \times 0.015) + 5080 \sin \phi = (12,230 \times 0.0125) - 12,230 \sin \phi.$$

$$76.2 + 5080 \sin \phi = 152.875 - 12,230 \sin \phi.$$

$$17,310 \sin \phi = 76.675,$$

$$\sin \phi = .00443,$$

loaded cars out as it could pull empty cars in the opposite direction.

The preceding formula does not consider the weight of the motor or locomotive, the effective weight of which will also depend on the grade.

If in the foregoing example we wished to use an 8-ton motor having a tractive pull of 3000 lb. on the level, and secure an equal drawbar pull and maximum loading, the formula will be somewhat different.

Let

M = Weight of motor;

F = Tractive effort of motor.

Then

$$\frac{F + M \sin \phi}{(W'') - W'' \sin \phi} = \frac{F - M \sin \phi}{(WC) + W \sin \phi}$$

Solving,

$$\phi = 5 \text{ in. per 100 ft.}$$

With the same motor compelled to handle cars loaded with rock, the formula in order to make the grade balance the extra resistance of a full trip of rock, the weight of each car being 17,000 lb., would be, letting W'' = weight of a loaded rock car,

$$\frac{F + M \sin \phi}{(W''C) - W'' \sin \phi} = \frac{F - M \sin \phi}{(WC) + W \sin \phi}$$

or

$$\phi = 7 \text{ in. (almost) per 100 ft.}$$

The grade on straight track should then be between 5 and 7 in. per 100 ft., and the above motor would be able to pull in by about 28 empty cars and the same number out, loaded.

When it is considered that curved track makes up a large portion of every gangway and that the tracks are dirtiest immediately after the cars have been loaded from chutes (all of which has a greater effect on the loaded car), it will be apparent that this theoretic grade

should be increased to assist in overcoming these contingencies.

Other considerations that would still further increase the grade in favor of the load are the usual methods pursued in panel mining and the loading of the cars.

It is customary in panel mining to drive the coal gangways first, and when they have advanced far enough to begin robbing, to tunnel to a haulage gangway, cutting off the outer section. This frequently increases the length of the tunnels and necessitates a proportionate decrease in the grade of the haulage. As a consequence, where the tunnels are long, the inclination of the haulage road, which by all means should have the best grade, is much reduced, and wet roadbed, choked ditch and small trips naturally result.

Since the installation of mechanical haulage in mines loading from chutes, the loaders are compelled to move

vances; this, however, will remedy itself in all subsequent levels.

In the case of light pitching beds, increasing the grade of new headings may mean a too serious shortening of the available lift, and in those headings already driven the flat grades will limit the length of the trip.

These objections, as well as that arising from the necessity of moving the cars while loading, can be overcome to a great extent by the use of bearings that reduce the journal friction. An improved type, such as the Hyatt roller bearing (as has been demonstrated by dynamometer tests), will require on the level but about 40 per cent. of the draw-bar pull necessary with the common type of bearing, or conversely, on the level a motor will pull $2\frac{1}{2}$ times as many cars if they are equipped with antifriction bearings as it will if plain bearings are used. The accompanying charts, Figs. 10

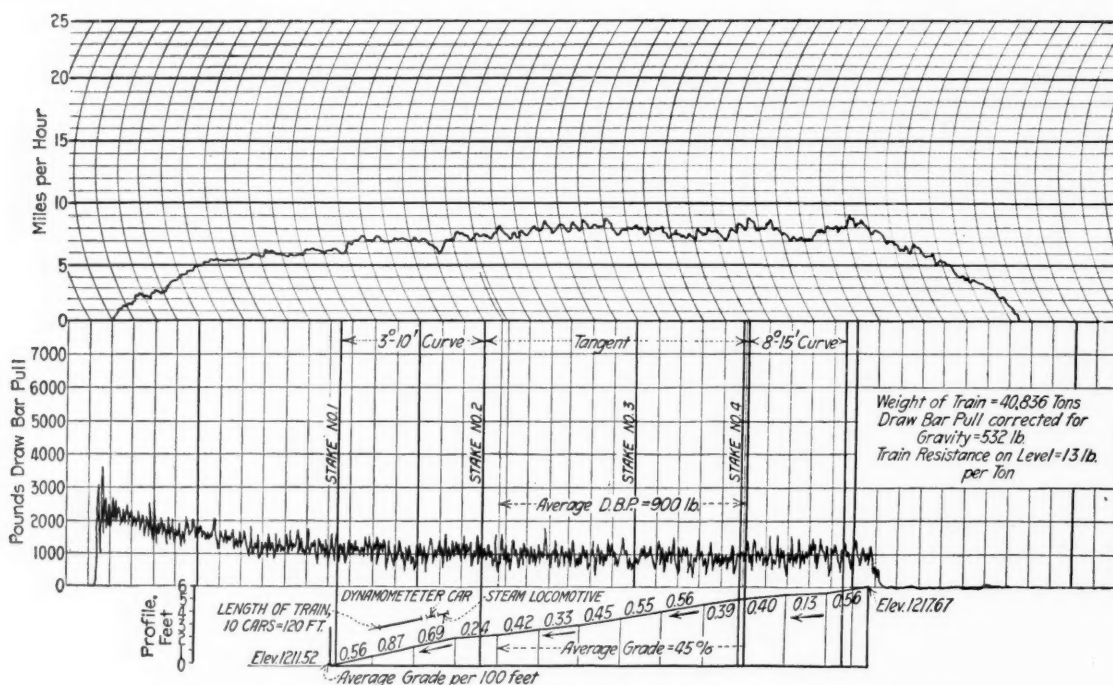


FIG. 11. DYNAMOMETER RECORD CHART OF ROLLER-BEARING CAR TRIP

the cars at the loading places by their own efforts. Four cars per trip are not infrequently loaded from one chute. On the lighter grades, to move the cars sufficiently to accomplish this loading would require an additional man, and to forestall this expense the foreman resorts to increasing the grades immediately beneath the chutes and inserting an equalizing diminution between them. This expedient facilitates the loading of the cars, but renders the roadbed a succession of flat places and inclines, with pools of water in the "dead spots." It raises the haulage cost, destroys the rolling stock and imparts a bumping and jerking to the cars in motion. It is needless to state that a proper grade would remove the necessity for this distortion.

In the gangways where the grades have been produced by trusting to the judgment of the workmen, the inclination usually is from 8 to 12 in. per 100 ft., and I am inclined to believe that these grades have more to recommend them than the lesser ones.

One objection to the heavier grade is that its first installation reduces the available lift as the gangway ad-

and 11, are from actual tests and show the draw-bar pull of roller bearing and plain bearing cars. Both tests were over the same run. The low starting effort required for the improved bearing should be noted. The grade formulas will have to be applied to determine the results for level track.

Substituting in the formula, and using the same weights:

$$\begin{aligned} (WC) + W \sin \phi &= (W'C') - (W' \sin \phi) \\ (5080 \times 0.006) + 5080 \sin \phi &= (12230 \times 0.005) - 12,230 \sin \phi \\ 30.48 + 5080 \sin \phi &= 61.15 - 12,230 \sin \phi \\ 17,310 \sin \phi &= 30.67 \end{aligned}$$

$\sin \phi = 0.00177$. This multiplied by 100, will give the per cent. of grade, which is 0.177 ft., or $2\frac{1}{8}$ inches.

Thus with suitable antifriction bearings it would require on a grade of $2\frac{1}{8}$ in. per 100 ft. the same effort to move a loaded car with the grade as is required for an empty car moving against it.

The antifriction bearing will run several months on one lubrication, thereby eliminating to a great extent

the embarrassment of stiff cars. They will be found advantageous in locations where the available elevation for compensating grades is limited and in reducing the elevation required for the car planes in overcoming differences in grade; also on light pitching slopes where the cars are barely able to drag the rope.

CONSTRUCTING GRADES

Grades on the surface are secured by running levels over stakes set at regular intervals and then marking the cuts or fills required to reach the grade selected, upon the stakes, to which the surface is then cut or filled.

In the flat measures underground, the headings are generally driven on line, the grade of the heading being the profile of the bottom rock along the line of heading.

In the gangways or headings which are not driven on line, it is apparent that neither of the methods given can be used; by the first method the heading would have to be already driven before the grades could be run and marked; by the second method a line would have to be given, which, of course, would be impossible in the heavy pitching seams.

Under this last condition, and also for tunnels, the grade is extended by means of a grade board; that is, a board equipped with a spirit level set in its top, or with a plumb-line which hangs from an upright in the center of the board. The grade is carried by having one end of the board wider than the other, this extra width being the amount that the grade in question would rise or fall in the length of the board. This extra width is known as the "toe."

Grade boards are usually cut in fractional lengths of 100 ft., such as 6½ ft., 10 ft., 12½ ft., etc., so that the toe can be readily calculated and the board will be of a length convenient for use. The following table gives the toes to the nearest 1/16 in. for a 10-ft. grade board on grades from 0 per cent. to 10 per cent.:

TOES FOR 10-FT. GRADE-BOARD FROM 0% TO 10% EVERY 1/16 IN.

Per Cent.	Toe, In.	Per Cent.	Toe, In.	Per Cent.	Toe, In.	Per Cent.	Toe, In.	Per Cent.	Toe, In.
0.00	0	2.00	2 1/4	4.00	4 1/2	6.00	7 1/4	8.00	9 1/2
0.05	1/16	2.05	2 1/8	4.05	4 5/8	6.05	7 5/8	8.05	9 5/8
0.10	1/8	2.10	2 1/4	4.10	4 3/4	6.10	7 3/4	8.10	9 3/4
0.15	3/16	2.15	2 1/8	4.15	5	6.15	7 7/8	8.15	9 7/8
0.20	1/4	2.20	2 1/2	4.20	5 1/8	6.20	7 7/8	8.20	9 7/8
0.25	5/16	2.25	2 3/8	4.25	5 1/4	6.25	7 7/8	8.25	9 7/8
0.30	3/8	2.30	2 3/4	4.30	5 1/2	6.30	7 7/8	8.30	9 7/8
0.35	7/16	2.35	2 3/4	4.35	5 1/2	6.35	7 7/8	8.35	10
0.40	1/2	2.40	2 3/4	4.40	5 1/2	6.40	7 7/8	8.40	10 1/8
0.45	9/16	2.45	2 3/4	4.45	5 1/2	6.45	7 7/8	8.45	10 1/8
0.50	5/8	2.50	3	4.50	5 1/2	6.50	7 7/8	8.50	10 1/8
0.55	11/16	2.55	3 1/8	4.55	5 1/2	6.55	7 7/8	8.55	10 1/8
0.60	3/4	2.60	3 1/8	4.60	5 1/2	6.60	7 7/8	8.60	10 1/8
0.65	7/8	2.65	3 1/8	4.65	5 1/2	6.65	8	8.65	10 1/8
0.70	1 1/16	2.70	3 1/8	4.70	5 1/2	6.70	8 1/8	8.70	10 1/8
0.75	1 1/8	2.75	3 1/8	4.75	5 1/2	6.75	8 1/8	8.75	10 1/8
0.80	1 1/4	2.80	3 1/8	4.80	5 1/2	6.80	8 1/8	8.80	10 1/8
0.85	1 1/2	2.85	3 1/8	4.85	5 1/2	6.85	8 1/8	8.85	10 1/8
0.90	1 5/8	2.90	3 1/8	4.90	5 1/2	6.90	8 1/8	8.90	10 1/8
0.95	1 7/8	2.95	3 1/8	4.95	5 1/2	6.95	8 1/8	8.95	10 1/8
1.00	2	3.00	3 1/8	5.00	6	7.00	8 1/8	9.00	10 1/8
1.05	2 1/16	3.05	3 1/8	5.05	6 1/16	7.05	8 1/8	9.05	10 1/8
1.10	2 1/8	3.10	3 1/8	5.10	6 1/8	7.10	8 1/8	9.10	10 1/8
1.15	2 1/4	3.15	3 1/8	5.15	6 1/8	7.15	8 1/8	9.15	11
1.20	2 3/8	3.20	3 1/8	5.20	6 1/8	7.20	8 1/8	9.20	11 1/8
1.25	2 1/2	3.25	3 1/8	5.25	6 1/8	7.25	8 1/8	9.25	11 1/8
1.30	2 5/8	3.30	3 1/8	5.30	6 1/8	7.30	8 1/8	9.30	11 1/8
1.35	2 3/4	3.35	4	5.35	6 1/8	7.35	8 1/8	9.35	11 1/8
1.40	2 7/8	3.40	4	5.40	6 1/8	7.40	8 1/8	9.40	11 1/8
1.45	3	3.45	4	5.45	6 1/8	7.45	8 1/8	9.45	11 1/8
1.50	3 1/8	3.50	4	5.50	6 1/8	7.50	9	9.50	11 1/8
1.55	3 1/4	3.55	4	5.55	6 1/8	7.55	9 1/8	9.55	11 1/8
1.60	3 3/8	3.60	4 1/8	5.60	6 1/8	7.60	9 1/8	9.60	11 1/8
1.65	3 1/2	3.65	4 1/8	5.65	6 1/8	7.65	9 1/8	9.65	11 1/8
1.70	3 5/8	3.70	4 1/8	5.70	6 1/8	7.70	9 1/8	9.70	11 1/8
1.75	3 3/4	3.75	4 1/8	5.75	6 1/8	7.75	9 1/8	9.75	11 1/8
1.80	3 7/8	3.80	4 1/8	5.80	7	7.80	9 1/8	9.80	11 1/8
1.85	4	3.85	4 1/8	5.85	7 1/8	7.85	9 1/8	9.85	11 1/8
1.90	4 1/8	3.90	4 1/8	5.90	7 1/8	7.90	9 1/8	9.90	11 1/8
1.95	4 1/4	3.95	4 1/8	5.95	7 1/8	7.95	9 1/8	9.95	11 1/8
2.00	4 1/2	4.00	4 1/8	6.00	7 1/8	8.00	9 1/8	10.00	12

Another convenient way is to make the level board 100 in. long. The required grade per cent. expressed in feet

is then equal to the toe required in inches; the length of the board is to 100 ft. as 1 is to 12, or as 1 ft. is to an inch.

For example: On a grade board 100 in. long, if the grade required is 0.75 per cent., the toe is 0.75 in., or 3/4 in. The toe ends of grade boards are given some distinguishing mark to avoid confusion, particularly in the flatter grades.

Wherever possible, gangways and headings should be driven on a calculated grade, or approach as closely thereto as is practical. This should be done if only for the sake of haulage, but its importance in the event of future developments warranting a tunnel to connect parallel haulages, or in case of panel mining, is inestimable. A system of headings or gangways graded to conform with one another will save many regrets and afford many economic possibilities.

On the surface, especially where the adopted grade is a factor in limiting the length of the trip of cars, the inclination on curves should be reduced; so that the grade allowed on the curves plus the resistance due to curvature will equal the grade on the straight track. The compensation or allowance for curvature is usually spoken of in terms of the grade proportional to the degree of curve as discussed under the most economic radius to use underground, page 230.

For example: If the prevailing grade for the road is 2.5 per cent., then on a 100-ft. radius, or 57 deg. curve, the compensation per 100 ft. would be 57 × 0.010 to 57 × 0.025, or 0.6 to 1.4 ft. respectively, depending on the particular cars used. The grade on the curve should be 1.9 to 1.1 ft. per 100 feet.

(To be continued)

Full Power Now Granted President by Food Control Bill

The food control bill as now amended gives the President complete power for commandeering and price fixing. The bill provides that whenever the President shall find it necessary to secure an adequate supply of necessities for the support of the army or the maintenance of the navy, or for any other public use connected with the common defense, he is authorized to requisition and take over, for the use or operation by the Government, any factory, packing house, oil pipe line, mine, or other plant, or any part thereof, in or through which any necessities are or may be manufactured, produced, prepared, or mined, and to operate the same.

The United States shall make just compensation, to be determined by the President, for the taking over, use, occupation and operation by the Government of any such factory, mine or plant, or part thereof. Provision is made entitling the property owner to sue the Government for just compensation if the price determined upon is not satisfactory. This restriction is needed to make the bill accord with the requirements of the Constitution.

Gasoline and kerosene are eliminated from the section providing for the licensing of producers of fuel oil, coal, fertilizer and farming implements, packing houses, grain elevators, etc., but there is in the bill ample authority for the control of the oil and even the steel and copper industries under the requisitioning power given to the President by the United States Congress.

Coal Mine Investigations—II

SYNOPSIS—*This installment of the article summarizing the research work of the United States Bureau of Mines treats of the study of mine air in Illinois mines and the work at the bureau's experimental mine.*

THE Bureau of Mines, in coöperation with the State of Illinois through the engineering experiment station of the University of Illinois and the state geological survey, is investigating the quality of the mine atmospheres in the coal mines of the state and the effect of different agencies on the air.

To obtain information on the liability of methane accumulating in unsuspected places should the ventilation be temporarily shut off or interrupted, a number of samples were collected in mines in Illinois and Indiana while the mine fan was stopped or while the ventilation was interrupted by blocking an air passage. Analysis of the samples showed that in some places where the gases diffused evenly when the fan was running at normal speed, the methane began to stratify as soon as the ventilating current was stopped, and within a relatively short time the increase was enough to have greatly assisted in initiating a mine explosion and have made a nonexplosive cloud of coal dust violently explosive. This investigation is of importance to those mines that practice slowing down the fan or otherwise interrupt the ventilating current before the firing of shots of black powder.

The bureau's investigations made in coöperation with the State of Illinois have shown that there is a wide range in the amount of methane given off in the coal mines of that state. A large number of samples collected in two long-wall mines near La Salle were entirely free from methane, and the only samples containing methane from these mines showed less than 4 parts in 10,000 parts of air, or less than 0.04 per cent. On the other hand, some of the mines in Illinois may liberate large quantities of methane. One mine working the No. 5 bed in Saline County struck a zone of gas feeders which after 8 days gave off 40 cu.ft. of methane per minute, or 57,600 cu.ft. per day, from the face of two entries. Forty-eight days later this zone was giving off 24.7 cu.ft. per minute. The coal had not been displaced but had been subjected to shearing stresses.

To prevent accidents from ignition of firedamp, the tendency in some Illinois mines has been to reduce the interval between the time the mine is examined and the time the men go to work in the morning. Also, more care is being taken to keep men from entering abandoned or caved workings. One method of doing this has been by the use of woven wire and poultry netting barriers with locked gates so that only authorized persons can pass through.

EFFECT OF USE OF EXPLOSIVES ON RETURN AIR

To determine the effect of the gases from blasting on the mine air a study was made of the return air current in an Illinois mine where approximately 18,000 cu.ft. of air per minute was circulating. After approximately 1850 lb. of powder had been used for blasting, analyses of air samples showed that the change in the air was small, there being approximately 0.05 per cent. increase in inflammable gases and 0.1 to 0.2 per cent. increase in carbon dioxide, with a corresponding deficiency of oxygen. The slight increase of methane would indicate that little methane was liberated by the shooting. The return air was distinctly hazy, and the odor of sulphur made it unpleasant. The mine itself was generating a relatively small amount of methane.

A large number of samples of mine air were collected in Illinois mines to determine the ratio between the oxygen absorbed from the air by the coal and the amount of carbon dioxide added. The ratio between oxygen absorption and carbon dioxide emanation was found to vary widely, but the average of a number of analyses appears to establish a ratio of about 3 to 1, or, in other words, while the air was in circulation about three volumes of oxygen was absorbed for one volume of carbon dioxide added.

The experimental mine of the Bureau of Mines was opened in December, 1910, for the purpose of making explosion tests in connection with a study of the origin and progress of explosions of coal dust, of gas (methane), and of mixtures of coal dust and gas. The object was to develop and test methods of preventing or limiting such explosions. The mine is in the Pittsburgh coal bed and is situated on the side of a



MASONRY OVERCAST IN A MINE

ravine near Bruceton, Penn., 13 miles from Pittsburgh. The Pittsburgh coal at this point is nearly level and is 5 to 5½ ft. thick, and consists of two main entries 1300 ft. long; one pair of butts driven 300 and 350 ft.

to the left of the main entries, from which five rooms are turned, and a single butt entry 100 ft. long, turned to the right from the main entry. The inner 350 ft. of the main entry has a concrete lining. The purpose of this lining is to facilitate cleaning after explosion tests and to prevent particles of coal dust from the ribs and roof having any effect in tests with coals from other beds. At intervals of 200 ft. throughout the mine, except in the outer part of the main air course, large instrument stations of concrete are built in the rib. In these are placed measuring and recording instruments during explosion tests. In addition to these large stations are smaller intermediate stations. All the stations are connected to each other and to the outside by a cable in a pipe embedded in concrete in the rib.

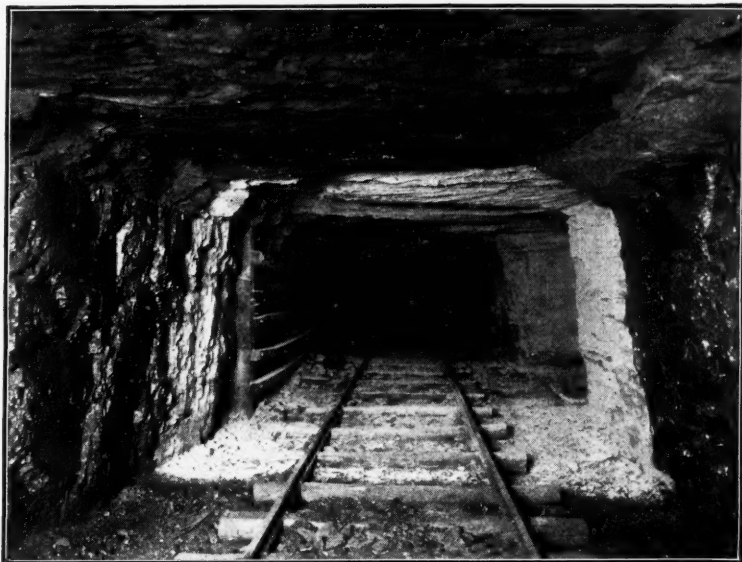
The instruments used are of two general classes—pressure instruments, each of which records the explosion pressure at the point at which it is placed, and circuit breakers, each of which causes a break in the circuit when the flame of the explosion passes, this break being recorded by a chronograph in the observatory. In the latest type of pressure manometer the variation in pressure is recorded by a ray of light acting on a photographic film; the passage of the flame is also photographed on the same film. By means of the time records on the various films it is possible to plot the various records according to time and distance from the origin and to study the progress of the explosion as shown in the pressure and flame records. As the time the flame passes both large and small stations is indicated by the circuit breakers, the velocity between any of these points can be calculated. The principle of the breaking of circuits is also used in ascertaining the time of operation of various protective devices used in connection with the explosion tests.

The coal dust used in the tests is prepared at a grinding house at the mine and immediately before a test is distributed on side shelves along the entry, on cross shelves about 8 in. beneath the roof and on the concrete floor, the usual distribution being at the rate of about 2 lb. of coal dust per linear foot of entry or 0.5 oz. per cubic foot of space. Generally an explosion is initiated by firing a blown-out shot of 4 lb. of FFF black blasting powder from a cannon placed on the floor of the main entry and pointed outward. The upper wires from the borehole are the shotfiring wires, and the wire passing across in front of the hole is part of the ignition circuit; when the shot is fired this wire is broken, and the time of break, or the starting of the explosion, is recorded in the observatory. The wires from the cannon pass

through a pipe in the rib to the surface at the main opening. The igniting shot is fired electrically from the surface after everyone is out of the mine.

When the shot is fired a flame about 12 ft. long re-

sults. The air currents stir up the coal dust from the floor and the sides, causing a thick cloud, which is ignited by the flame. The inflammation of this coal-dust cloud sets up pressures which cause increased air movements and an extension of the cloud, which in turn ignites; this process continues indefinitely as long as there is fine, dry coal dust to be acted on. With pulverized Pittsburgh coal dust the explosion travels the first 150 ft. in about 1 sec.; beyond this



ROCK-DUST TREATMENT TO ENTRY SURFACE
Treated surface in background; untreated surface in foreground

point the explosion increases in velocity and pressure until at a point 350 ft. from the origin the velocity may be as great as 3000 ft. per sec., with a pressure of 40 lb. per sq.in. The extension of the explosion for 200 ft. more may cause pressures as high as 100 to 120 per sq.in., which is about the maximum recorded by the instruments, although in all probability higher pressures have occurred in the explosion zone.

PURPOSES AND CHARACTER OF TESTS

The first tests at the experimental mine were made to demonstrate to large numbers of visitors that coal dust would explode. Later, the systematic study of explosions was begun. Up to July 1, 1916, 330 tests had been made. In general the tests have been made in order to study these points: The development of pure coal-dust explosions; the relative explosibility of various coals; the influence of the fineness and the quantity of the coal dust; the influence of small percentages of gas in the air current; the effect of the presence of rock dust; the effectiveness of rock dust barriers for limiting explosions, and the development of explosions in wide places.

In determining the explosibility of various coal dusts, mixtures of coal dust and shale dust or other incombustible dust are used. The proportion of incombustible dust is increased until a mixture is found through which an explosion will not travel. The percentage of shale dust required to prevent the explosion is the measure of the relative explosibility of the coal dust.

Two classes of tests, termed ignition and propagation tests, are made. In the ignition test the percentage of shale dust that prevents the mixture of shale and coal dust from being ignited by a standard blown-out shot from the cannon is determined; in the propagation test the percentage of shale dust that prevents propagation of an explosion started in a zone of more explosive dust, or by the ignition of a body of gas, is determined.

After determination has been made of the ignition and propagation limits of coal dust in an atmosphere containing no explosive gas, tests are made when small percentages of gas are present in the air current, and the percentage of shale dust necessary to prevent ignition or propagation as the case may be, with various percentages of gas, is thus determined. Explosibility tests of this character have been made with 12 different coals, ranging from low-volatile anthracite to high-moisture lignites.

Another factor that affects the explosibility of coal dust is its fineness. A large number of tests have been made to determine the influence of this factor. With Pittsburgh coal dust the percentage of shale dust required increases from 50 to 80 per cent. as the proportion of coal dust fine enough to pass a 200-mesh screen is increased from 10 per cent. to 75 per cent. This shows how important is the fineness of the dust in a mine, for the finer the dust the greater must be the precautions taken to prevent widespread explosions.

METHODS OF MAKING COAL DUST NONEXPLOSIVE

There are two general methods of rendering coal dust nonexplosive—first, by wetting the dust to prevent a cloud of dust from being formed, because only when the coal dust is in a cloud is it explosive; second, by adding to the coal dust enough incombustible dust to make the mixture nonexplosive. The first method is extensively used; the second is comparatively new in the United States.

The first coating is applied by hand, and the use of limestone dust gives an entry the appearance of being whitewashed. Later, when it is necessary to redust, the dust is blown into the air current by means of a blowing machine, and this dust settles down on ledges and surfaces on top of the coal dust that has accumulated, and keeps the latter from becoming explosive.

Ordinarily only the coal dust in the haulage entries is treated, but the parallel air course may contain considerable coal dust that would propagate an explosion. To obviate this danger, rock dust should also be blown into the air course.

TESTING MINE DUST WITH TAFFANEL "VOLUMETER"

The information gained from explosibility tests of the quantity of shale dust necessary to prevent mine explosions is very valuable in developing the rock-dusting method of rendering coal dust inert; if the explosibility of the road dust be questioned, analysis of samples will show whether the percentage of incombustible in the road dust is sufficient to prevent the propagation of an explosion along that road. Analyses of such samples showing the percentage of incombustible dust present can be made quickly with an instrument called a "volumeter," designed by Mr. Taffanel, of France. A definite amount of the dust is placed in the instrument with a definite volume of alcohol, and the height to which this material rises in a graduated stem shows the percentage of incombustible dust present.

As has been indicated, in order to have efficient protection from widespread explosions, rock dusting should be done throughout a mine, as no one can foresee at just what point an explosion may start. As long as rock dusting or watering is satisfactorily maintained there should be no danger of an explosion being propa-

gated throughout a mine; but if method is used and not adequately maintained there should be supplementary means of preventing an explosion from spreading throughout the mine and possibly causing the death of everyone in it. So-called "rock-dust barriers," based on devices tested in France, have been designed by George S. Rice, chief mining engineer of the Bureau of Mines, and tested at the experimental mine. Models of each of several types were developed which in a large number of tests stopped propagation of explosions.

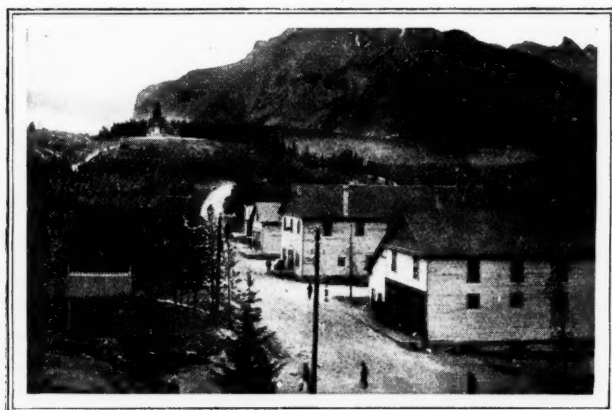
One of the most easily constructed and effective of these barriers is known as the "trough barrier." It consists of six or more troughs extending across the entry at intervals of about 6 ft., with the bottom boards held in position by a lever system connected by wires to suspended vanes 100 ft. on either side of the troughs. Should an explosion occur the vanes are caused to swing, thus releasing the bottom boards of the troughs, and the dust contents fall to the ground in a dense cloud. The dense dust cloud cools the gases to such a degree as to prevent propagation of flame beyond.

ISOLATING EXPLOSION AREAS BY BARRIERS

Such barriers are feasible at the entrances to all splits of the air current or sections of a mine, and at points along the main haulage roads, so that if an explosion occurs it will be arrested by the barriers, and will not spread throughout the mine. If an explosion should occur in a particular split in which the dust on the roads was explosive, it would not travel beyond the barrier at the entrance to the split. The men in the split might lose their lives, but the men in other parts of the mine would have a better chance of getting out.

Most of the tests made have been made in entries or narrow places, because most explosions are initiated in such places. However, as some explosions start in wide places, a few tests have been made with reference to the development of explosions in such places. These tests indicate that such explosions can be initiated with comparative ease by a single blown-out shot if enough fine coal dust be present. It was also found that cut-throughs (break-throughs) near the point of origin hindered the development of the explosion; the cut-throughs permitted considerable release of pressure at the time when the explosion is just getting under way and so deadened its force at the very start.

(To be continued)



PART OF MINE CAMP AT BANKHEAD, ALTA., CANADA:
COMMISSARY IN FOREGROUND

The Engineer's Part in the War

SYNOPSIS—*In the present war the old military lines have practically been thrown aside for a special industrial organization whose business is war. The article shows how important is the part played by engineers in the conflict.*

THIS is a war of engineers." Just what does this oft-quoted phrase mean? Capt. Gustave P. Capart, of the general staff of General Pétain, who is at present in this country as a member of the French scientific commission, indicates that the answer to this question involves a new understanding of what military operations are today.

When it is stated that this is a war of engineers, that statement means that the old military lines of organization have practically been thrown aside at the front, and in their place has been built up a specialized industrial organization whose business is war. We no longer have infantry, cavalry and artillery in the old sense of the words. We have a planned organization for offensive military operations, in which the plans are made on an engineering basis, in which the fighting is done in many branches of the service by engineering methods, and of which the operations are carried on by engineering work in roadmaking, in transportation, in industrial management and factory operations.

Captain Capart, in an interview with the *Electrical World*, points out that this war is being fought with prime materials. The modern battle, he states, is a problem of roads and a problem of transport. In the maintenance of railways and roads, as well as in the construction of new extensions, a large and highly trained personnel is required for the laying of tracks, for repair shops, drivers and conductors, for the handling of construction material, etc.

Cableways and telferage systems have given extraordinarily valuable service at the front. In one installation 600 mules were turned to other service by the installation of a telferage system. The automobile, with its camions and its tractors, is another valuable link.

ELECTRIC POWER EXTENSIVELY USED AT FRONT

The electrical engineer is playing a wonderful part in this war. Great distribution systems for electric light and power have been necessary for the use of armies. The headquarters of the armies, the cantonments, artillery, repair shops, hospitals, air service, etc., all use electric power. Machinery and skilled men are necessary for air compressing, rock drilling and trenching machines.

The Government of the United States has comprehended fully the importance of the organization of engineers in these many lines, and the engineer regiments which have already responded to the military needs indicate the ability of this country to furnish the class of men needed for the military industrial work.

In this country we must understand that to prosecute the war successfully we must think not only of materials and of human energy in tremendous totals, but we must think of using materials and literally of using

human energy with the highest efficiency. Men must be selected for their places in this great industrial war, not on the basis of their physical characteristics alone, not on their ability to carry a gun, but on the basis of special knowledge to fit them for positions of responsibility and of specialized training which this war demands.

Captain Capart believes that in the United States we have the opportunity to combine the knowledge and the experience of what has been done in three years of war, and that our armies should go to France organized in such a way as to fit them for the industrial task which lies ahead of them. Captain Capart points out that our engineers who go to France as military men in their specialized branches will also be pioneers of American industry in times of peace and will prepare the ground for the economic war which is expected to follow when the military battles are over.

THE FOUR ZONES IN MODERN WARFARE

Military operations may be thought of as being conducted today in four zones—first, the firing line; second, the military zones immediately surrounding the firing line; third, the avenues and channels of communication between the military zone and what may be called the world-wide zones of supplies to that military zone, and, fourth, the zones of supplies themselves, which include the countries at war and the countries which are supplying food, machinery and materials for the combatants.

Captain Capart points out that specialized engineering training is necessary in all these war zones. On the firing line—troops in contact with the enemy—engineers are involved in the strictly military operations, mining engineers are planning the executing of trench work, earth work, concrete work and so on. On this same battle line are engineers who maintain what the French so interestingly explain as a "liaison"—the nerves of communication between the various sectors of the armies, the telephone, the telegraph, the semaphore, the wigwag system, wireless, heliograph; in short, the coordination of communication by every means known to science.

In the military zone, which is entirely in the control of the military and potentially and actually threatened by the enemy, engineers are busy building and maintaining roads, constructing, maintaining and operating railroads, building, rebuilding and operating automobiles, constructing narrow-gauge railroads, cableways, telferage systems, etc. In this military zone electrical engineers are at work building and operating lighting and power plants, erecting and maintaining distributing lines, handling the network of telephone and wireless centers of communication. Water-works and water-supply engineers, sanitary engineers, engineering construction gangs erecting shelters and raising camps and cantonments and repair shops for airplanes, automobiles, artillery, small arms—all are necessary, and more are required in the military zone.

In the same way, Captain Capart has indicated that engineers with their specialized knowledge are needed especially in the great problems that touch upon the transportation of the necessary materials between the military zone and the sources of supply which constitute what we have called the fourth great zone.



THE action taken with regard to coal in Illinois is directly at variance with the advice given to the Illinois authorities by Francis S. Peabody, the chairman of the Committee on Coal Production. It was the opinion of W. S. Gifford, the director of the Council of National Defense, and of William B. Colver, of the Federal Trade Commission, that it would be best for all concerned if the Federal Trade Commission were named arbitrator in the Illinois price controversy. Mr. Peabody and the coal committee concurred fully in that view. "We believe," said Mr. Peabody in his telegram, "that the Federal Trade Commission is the only agency that can determine scientifically the question at issue."

The consensus of opinion in Washington seems to be that the action taken in Illinois will have to be "unscrambled" and that it will occasion difficulties which the Federal Government should have been spared at this time. The matter would not be serious if Illinois alone were concerned, but it is practically certain that other states will follow the example set.

Much time was given last week by the Committee on Coal Production to the coal situation in the Northwest. It is quite apparent that the difficulty does not lie with the boats. Great room for improvement is said to exist in the railroad situation, but reports reaching Washington indicate that the insistence of the Northwest that its needs be supplied with Eastern coal is one of the important factors of the situation. While plenty of coal could be secured in Indiana and Illinois, advantage is not being taken of this source of supply. The agitation for state control of prices also has had an unsettling effect upon conditions in the Northwest. Dealers hesitate to buy when the chance is apparently good that the states will force substantial reductions in price.

Coal production throughout the country continues to decrease, as is shown by the weekly statements of the Geological Survey. The report, issued last Saturday, shows 74.6 to be the percentage of full time capacity as compared with 75.8 per cent. for the preceding week. The chief decline in production was in Illinois, Indiana, western Pennsylvania and southern Virginia. There was practically no increase in the production in Ohio. Car shortage, labor shortage and labor disturbances are given as the chief causes of failure to realize a higher percentage of full-time capacity. While not mentioned in the Geological Survey's report, it is believed that uncertainty as to the attitude of the Government toward the coal industry and the extremely hot weather throughout the country also were contributing causes. A better car supply is reported from Virginia and the South. Car

shortage, however, continued to be the principal factor limiting production throughout the Northern states, according to the report, which was prepared by C. E. Leshner. Figures for Alabama became available for the first time in last week's report. These figures indicate that the mines in that state are running with less interruption than are those in any other state reporting. The highest percentage of losses during the week under review took place in Indiana. More than 800 mines are now making returns on which the statements are based.

Another appeal, based on patriotic grounds, will be mailed out soon by the Committee on Coal Production to the operators and miners. An extract from the text of the appeal reads as follows:

We call upon the coal operators and miners of the United States to rise to the present national emergency—to render the best service that is in them in advancing the cause of our country in the great struggle for democracy as opposed to autocracy—and we urge that all elements of society make sacrifices to support the flower of American manhood, who will soon go forth in battle to uphold the principles of freedom, justice and humanity. As we operators and miners cannot all fight in the trenches, we can and must do our part in the war by working as earnestly, constantly and faithfully as our armies will fight gallantly on the battlefields of Europe.

The document is signed by F. S. Peabody, the chairman of the committee, and William Green, the secretary of the United Mine Workers. With regard to coöperation between operators and miners, the following statement is made:

It is not the intention of this committee to seek to restrict arbitrarily the normal activities of operators or miners, but we are interested, as the whole nation must be, in maintaining uninterrupted operation in the coal-mining industry and in securing at all times the maximum production of coal. This committee, representing the coal operators and miners, renders great service in promoting good will and harmony in the coal industry and in coöperating for the purpose of bringing about the adjustment of differences between operators and miners to the end that production may be increased.

The present coöperation between those actively engaged in the conduct of the coal industry will prevent the putting into effect of any extreme or arbitrary policy which would interfere with the freedom of action of the coal operators and coal miners of the country. In the judgment of the committee the problems affecting this industry can be more effectively solved and the interest of our nation and the public more properly protected by the men who, from the nature of their business and occupation, are essentially qualified to deal with them. It is necessary that a proper degree of voluntary restraint be exercised to the end that not only the maximum production be obtained, but that the public may be able to rest secure in the knowledge that its interest will be safeguarded.

In addition to going to all mine operators, the statement will be sent to the secretaries of all the local divisions of the United Mine Workers of America.

In his latest official report, W. S. Gifford, director of the Council of National Defense, refers to the work of the Committee on Coal Production as follows:

The Committee on Coal Production has been constantly engaged in the work of stimulating production and in arranging for an adequate supply of coal to meet the combined needs of the navy and army, the American civil population and to some extent the European allies. Through conference with railroad officials and shippers it has brought about a pooling arrangement for the Atlantic Tidewater region which already promises to do away with the waste in car and barge service under the old system of individual consignments and make possible a great increase in shipments to New England and the other Northeastern States. A similar arrangement for the Great Lakes and the Northwest has been in successful operation for many weeks. It has also been of material service in the adjustment of prices. Particular attention has been given to securing prompt shipment for all war purposes, both military and industrial.

The Federal Trade Commission is understood to be desirous of acting as arbiter in some of the labor disputes which are hampering coal production. The work of the commission in arriving at costs of coal production are reported to be progressing favorably, but no prediction is being made as to when the final figures will be ready for transmittal to the President.

What may be expected in other cities can be judged from the Federal Trade Commission's hearings on the retail coal situation in Washington. In reporting on the situation in Washington, the commission issued a statement, of which the following is a part:

The Federal Trade Commission has secured the coöperation of all producers of anthracite coal to produce an increased tonnage for 1917 and to market it at moderate prices. Production for the months of April, May and June was 25 per cent. greater than for the same period of 1916. The large producing companies sell at circular prices, issued by themselves, to which they adhere strictly. Individual purchasers, not connected with the railroads, sell at prices for all domestic sizes except pea, not to exceed 75c. higher than those of railroad coal companies. Activities of speculative jobbers have been curtailed and the number of sales between the mine and the retailer reduced to one or, at most, two sales at the present time. The Federal Trade Commission will continue to use all of its powers to see that the public is supplied with a normal amount of fuel at moderate prices.

Bituminous prices to the general public have not yet come under regulation. Legislation now pending contemplates further regulation of both prices and distribution under Federal authority.

With bituminous production and prices coming under supervision and regulation; with wholesale prices of anthracite stabilized as they have never been before; and with every indication that the production of anthracite for the remainder of 1917 will be larger than in the past, the retail dealers of Washington should all adjust their prices and margins to figures that will yield no more than a moderate and reasonable return for the service rendered the public.

Dealers' supplies have, in most cases, been larger than normal. Barring increased wages to mine labor, present prices of anthracite at the mines will not increase beyond the normal 10c. per ton Sept. 1, which will bring prices up to the winter circular level. Any proposed increase in anthracite prices greater than 10c. per ton on Sept. 1 is therefore totally unjustified. Present indications are that bituminous prices will be reduced in the future. Further indulgence in high prices and excessive margins on the part of dealers of Washington or of other cities can be regarded only as an open declaration of a policy of "profiteering" on the part of dealers.

Dealers should apportion their available supply to meet the needs of their customers. Consumers should give their orders for their normal tonnage at the time they customarily buy, and should not demand the immediate delivery of coal that they will not need until well into the winter. The general demand of consumers for a year's supply of domestic

coal in the spring and summer has created a situation all over the country which can be relieved only by the retailers delivering the coal as it is produced. This need causes consumers no uneasiness. It has always been the way in which their needs have been supplied in the past, and present indications are that the supply of anthracite coal produced for the coal year, April, 1917, to April, 1918, will be at least 25 per cent. larger than for the preceding year.

Fifty per cent. of all coal cars which are furnished in the fields shipping to Lake ports are to be used for Lake cargo coal, it was decided at a conference Tuesday at which the Committee on Coal Production, the Interstate Commerce Commission, the Federal Trade Commission, Council of National Defense, railroads, operators, shippers and other interests were represented. The object of the conference was to devise means whereby the Northwest would be assured ample coal for the coming winter. It is expected to secure a priority order which will make it obligatory to carry out the conclusion reached at the conference. As the priority order must be issued by the President, and as some delay may be unavoidable in getting the matter before him, it is expected that the finding of the conference will be carried out voluntarily so as to go into effect immediately.

In addition to Francis S. Peabody, who acted as chairman of the conference, those present were:

F. C. Baird, commissioner, Lake Bituminous Coal Exchange; G. L. Peck, chairman, Lake Coal and Ore Committee; Daniel Willard, chairman, Advisory Committee, Council of National Defense; E. H. DeGroot, Jr., H. C. Barlow and A. G. Gutheim, Interstate Commerce Commission, Division of Car Service; C. M. Sheaffer, chairman, Commission on Car Service; A. W. Crawford, *Chicago Herald*; William Collins, M. A. Hanna & Co., Cleveland; C. D. Caldwell, Byproducts Coke Corporation, Chicago; George D. Cameron, chairman, Executive Committee, Lake Coal Shippers, Cleveland; Wallace B. Donhan, vice chairman, New England Coal Co., Boston; W. H. Groverman, secretary, Northwestern Coal Dock Operators' Association, Minneapolis; Jay G. Hayden, *Detroit News*; Arthur Hale, vice president, Consolidated Coal Co., Baltimore; D. R. Lawson, secretary, Central West Virginia Coal Operators' Association, Fairmont; Harold F. Lane, *Railway Age Gazette*; J. D. A. Morrow, Committee Pittsburgh Producers' Association, Pittsburgh; Peter Reiss, president, C. Reiss Coal Co., Sheboygan, Wis.; F. X. Patterson, Federal Trade Commission, Washington; Tolbert St. Clair, Associated Press; W. J. Tomkins, Traffic Committee, Independent Salt Association, Chicago; Edward A. Uhrig, president, Milwaukee Western Fuel Co., Milwaukee; Paul Wooton, *Coal Age*; Paul N. Wilson, United Press; Charles D. Weeks, Milwaukee Coke and Gas Co., Milwaukee; R. S. McVeigh, vice president, Island Creek Coal Co., Cincinnati; J. P. Yoder, Federal Trade Commission; J. B. Zerhl, secretary, Pittsburgh Vein Operators' Association, Cleveland.

Final figures covering coke-oven accidents, compiled by the Bureau of Mines, show injuries to nearly twice as many men as in the average of several years preceding. In the opinion of Albert H. Fay, the statistician in charge of the work, there has been no increase in the hazards connected with the making of coke, but more complete reporting followed the operation of compensation laws. The fatalities, which have always been reported, show no variation from the average.

President Wilson was acquainted in detail with the coal situation in New England by a committee composed of F. C. Wright, representing Maine, H. M. Jones, Vermont, J. J. Storrow, W. B. Donham and H. H. Stimson, Massachusetts, J. R. Freeman and W. B. Vial, Rhode Island, Pearson, New Hampshire and Russell, Connecticut.

The Labor Situation

General Labor Review

The union is permitting the mine workers of eastern Tennessee and southern-eastern Kentucky to go on strike. It has been fostering a strike in Alabama to take place Aug. 20. This move, however, may yet be broken to pieces on the rocks of racial prejudice. The negro believes that he has a right to control wherever he casts the larger vote. In Colorado the union still permits its local leaders to talk strike without rebuke. These are nonunion districts. The beneficent work of union pacification has not been available in these states. They are victims, we are told, of competition between labor—examples of what happens where the collective bargain has not replaced aggression by agreement. But in the anthracite region, where we are told not to expect strikes because the union has a contract, button strikes have been numerous, and in Illinois there are indications that the whole state may soon be idle. There may be no coal obtainable at any price. The miners appear to have been working steadily and making wages larger than they could readily spend. They could have eased their miserable predicament by the purchase of Liberty Bonds. But there are many ways just as effective of ridding one's self of excessive coin. There is the strike, for instance. Now a strike has two advantages. It spends the money and it furnishes a holiday. The Liberty Bond only supplies the first need. The Illinois strikes are of every variety. They are started for higher drivers' wages, about powder, out of sympathy with the street-car men and against the superintendent of one of the mines. But over and above all they are started to make a holiday and as a chance to spend the money earned. The blood is over rich, and a rash breaks out all over the labor body.

Strikers Are Indicted for Treason

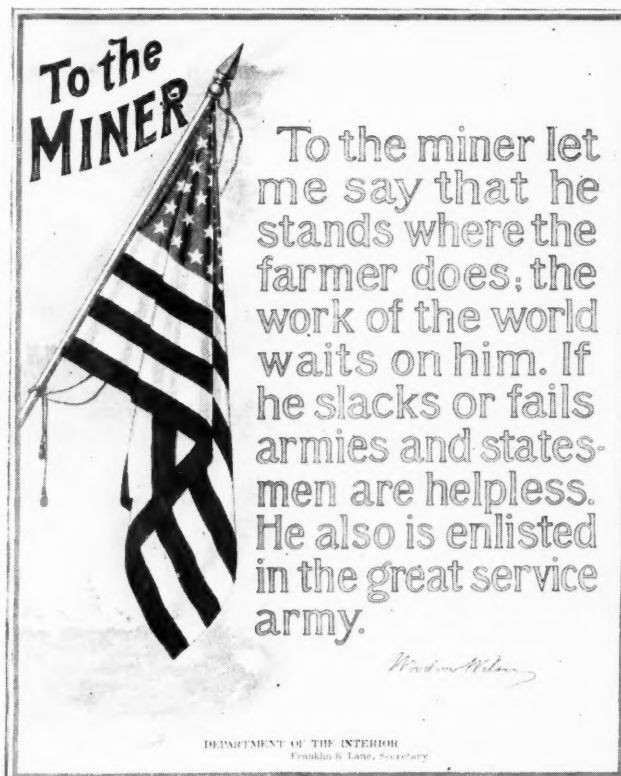
Three miners have been brought to Louisville from Clay, Ky., charged with firing on the National Guard during the disorders incident to the recent strike. They have been committed to jail at Louisville and charged with treason by the United States district attorney. On Aug. 2 it is said 50 men lined up on a hill above a group of eight soldiers commanded by Lieut. L. E. Barnes and fired on the soldiers. The shots were returned. After the brush, several rifles and more than a thousand empty shells are said to have been found on the hilltop. The men who have to defend themselves from this charge of treason are A. H. Cutsinger and W. J. Skinner, of Clay, and J. N. Collins, of Wheatcroft.

Peaceful Internment in Union Fold

The union still seeks in the anthracite region to act as a licensing board for mine workers. Those who pay its dues are to be permitted to practice mining, and those who don't should move away and make the anthracite field "safe for democracy," as John P. White would say.

The three district presidents of the anthracite region held a meeting last week with Mr. White to discuss the plans for a closed shop. The Wilkes-Barre convention's resolution

says that excluding nonunion men would mean a greater coal production—that is, if a closed shop is conceded, there will be no more strikes to secure it. This is a brilliant suggestion, like another made recently by a humorist. He said that if we would only do away with private property, burglary would decrease. The organized mine workers declare that excluding men from the mines who are not union men would rid the mines of Industrial Workers of the World. It appears, however, that the control of the members by the union after they have joined its ranks is so weak that introducing the closed shop would be as hopeless a method of reform as to require that all housebreakers and drunkards should join the church. The union has never been able to coerce those who have joined its ranks of their own free will. How will it then be able to restrain those who merely join because only by joining it can they ply their trade? The introduction of barbarians



POSTER ISSUED BY THE INTERIOR DEPARTMENT

into the church by forcible means—a pleasant custom of the long ago—always had an unfortunate effect on that institution. No less unfortunate would be the entry of the "I Won't Works" into the ranks of the United Mine Workers. The union is a desirable body to deal with in proportion to its approach to an organization of gentlemen. Add a lot of anarchistic roughnecks to its ranks, and it will approach by that much the nearer to a conscientiousless organization with which it will be useless to sign a contract.

But the union says, wherever these men are undesirable "reds," we will ourselves put them out. That is just what the coal companies are doing now, and they prefer to keep the choice in their own hands, feeling that they are entitled to it as they alone have to pay the men they employ. The discharge of undesirables is not an easy task for either the company or the union. It is likely to be followed in either case by a strike of those who side with the undesirables.

The matter is settled till 1920. No one has a right to discuss it till that time as long as there is a definite contract to be kept inviolate. Nor are strikes to secure the closed shop permissible. On Aug. 7 the Henry Clay, Big Mountain, Sterling and Luke Fidler collieries of the Philadelphia &

Reading Coal and Iron Co. and the Susquehanna Coal Co. had button strikes by which 3000 employees were laid idle. The union officials pointed out that the strike was a direct violation of the agreement, but the men struck nevertheless, arguing that when the mines were running steadily every man could afford the 50c. demanded.

The 1200 mine workers at the Philadelphia & Reading Coal and Iron Co.'s Henry Clay and Big Mountain collieries decided on Aug. 11 to go back to work on Aug. 13, though the union dues were not all paid. In lieu of striking they decided to guard the roads leading to the mines and turn back any nonunion men who would venture to go to work.

Organizers Abandon Johnstown

The union contends that Johnstown is not abandoned by the organization. A statement to that effect was issued on Aug. 9 by John Brophy, the district president. This document could only succeed in reaffirming what it denied, for agitation when in full swing is so evident that it needs no affirmation, and to deny an obvious condition only makes its existence more marked. Mr. Brophy declares that some of the operators favor the union and that the sentiment toward the union in Johnstown is steadily growing. Of all recent union activities, the one at Johnstown was the weakest and least effective.

Drivers Discontented with Wages

Declaring that they could not pay the prices for flour and other foodstuffs demanded at the present time, and that they could not keep up with the steadily increasing cost of living on the wages they were receiving, the drivers at the Crawford mine No. 12 put up their mules on the evening of Aug. 4 and went on a strike, demanding that their daily wages be immensely increased.

The action followed closely on that of the drivers at the Mary mine of the Otter Creek Coal Co. and at Crawford mine No. 14. As a result three of the large mines of the Brazil field were tied up pending a settlement. The drivers are now receiving \$3.60 a day, having been given an increase of 62c. a day when the recent general increase in the central competitive region went into effect.

The drivers demand that they be paid 9 hours' time for 8 hours' work, which would mean an increase of 45c. on the day. Edward Havercamp, the secretary of District No. 8 of the United Mine Workers, went to Indianapolis to confer with international officers. The operators are standing firm against the demands of the miners.

In Illinois it is impossible to describe the discontent as centering in the mule drivers. It is far too general for that. It has its origin in the large profits made by the operators of that and other states.

As a rule, the employee does not concern himself with the market. If he knows the selling price, he does not know the freight rate or other charges, and so is in doubt as to the actual profit of operation. The low price of slack usually makes calculation difficult. But now not only is the schedule high, but it is extremely definite and gives the price at the mines. That price looks so high to the driver that he wants a part of it, contract or no contract.

The miner is also dissatisfied, regardless of his well-filled envelope. He believes that not only is he underpaid, but other workmen also, and so he is ready for a sympathy-strike, not only with his fellow workers but with the striking street-car men.

Springfield is a sort of geographical center of Illinois. Draw a line from Springfield to St. Louis, Mo., or East St. Louis, Ill., and you go roughly through the new strike belt. The northern terminal Springfield at the end of last week had two mines out and three ready to come out in sympathy with the street-car men who are on strike. At that time 1500 men were affected. Proceeding southwesterly there is Auburn, where the two Solomon mines are closed, the drivers demanding nine hours' pay for eight hours' work. Here 750 men were idle.

Just beyond is Thayer, and still farther Virden, both Chicago, Wilmington & Franklin Coal Co. operations, and affiliated with the Chicago & Alton R.R., on which they are located. The men at these plants—and there are 1000 of them—are striking for a nine-hour pay with an eight-hour day. Still farther southwest you arrive at Carlinville, where there is a dispute regarding powder, 300 men being idle with this as the alleged reason.

A little twist in the line and after a short run you arrive at Gillespie, Benld and Sawyerville, the mines of the Superior Coal Co., where the union administration and rules are law and gospel. Here mines Nos. 1, 2 and 3 are out because of a demand of the 350 drivers that they be paid \$4.60 instead of \$3.60 per day. This demand is laying 3000 men idle. A little farther south is Mount Olive and Staunton, where the Consolidated Coal Co. has mines. There the men desire to remove Fred Weissenborn, the superintendent of the coal company.

Here the list ended on Saturday, but by Monday there were 32 out of 40 mines idle in the Springfield district; 10,000 men had quit work and the tonnage had been reduced by 20,000 tons. The number of idle mines on Tuesday had been increased to 50 by further strikes.

Frank Farrington, the president of the district, who was at Chicago, ordered the men back to work, and the vice president, Harry Fishwick, is said to have done the same without waiting for his chief. Walter C. Nesbit, secretary-treasurer, declares that the strike is without authorization. But what does that matter? The union belongs to the mine workers. In the last analysis they run it.

In the anthracite region the union wants the closed shop so that it can gather in the ruffians, and when it has them as part of its organization the union will have to do what these undesirable men order. Now the Illinois men probably do not have so many I. W. W. men among them, but such as they have they, with the radical element of the union, are breaking their contracts and disobeying their leaders.

It is said that at Virden the manager voluntarily gave nine hours' pay for eight hours' work, and when this became known at other mines the drivers at those plants wanted the same pay—and 100 per cent. more in some instances. Francis McLaughlin, the secretary of the Illinois Coal Operators' Association, denies that premiums have been paid at any of the mines.

New Union District Starts Strike

Last Monday virtually all parts of union district No. 19, in southeastern Kentucky and eastern Tennessee, were idle as a result of the call for a strike to take effect Saturday, Aug. 11, at 4 p.m. Operators in the various counties affected—Bell, Knox, Whitley and Harlan, in Kentucky, and Claiborne and Campbell, in Tennessee—have expected the strike for some time. They have placed guards and special deputy sheriffs on watch, with orders to act only defensively. Hywel Davies, the Federal mediator, has been on the ground for several weeks trying to arrange a settlement.

There are between 12,000 and 15,000 mine workers in the district affected. The presumption is that most of them are out. The daily output is normally 30,000 tons and the shortage will be severely felt by the Louisville & Nashville R.R., which, however, will still receive coal from the Hazard district. This may suffice, as with no coal to haul much less coal is needed.

The employees of the Wisconsin Steel Co., at Benham, have refused to quit work, and in the Jellico district the mines of the Proctor Coal Co. are reported to be continuing operation despite the strike order.

There is wild talk of German influence, but more discussion of the possibility of the workers leaving the field. It is said that the mine owners are not preparing to evict the striking men, but may even supply them with food from the commissaries. If the men want coal for cooking, they will have to dig it, for coal is scarce. Some are disposed to attribute the destruction of the power house of the Atlas Coal Mining Co. to malcontents among the workmen, but probably without any justification. The loss was \$7500.

Weiborn Scores Recognition Strike

J. F. Welborn, the president of the Colorado Fuel and Iron Co., on July 28 posted the following communication to the company's coal-mine employees in Colorado, where a strike threatens because the company, while not opposing the recruiting of members, will not recognize the union:

The interests of this company and of all its employees as well as the interests of our state and Nation have been seriously threatened by a strike proposed by the United Mine Workers of America. It is important that every employee should fully understand the situation. The Industrial Commission of Colorado, on June 29, advised me that notice had been received from James F. Moran, president of District 15, United Mine Workers of America, threatening a strike in all Colorado Fuel and Iron Co. coal mines on Aug. 1 "unless the present grievances can be adjusted before that time." I immediately replied to the commission, offering to adjust any complaints, and urging the commission to secure a list of the grievances referred to by Mr. Moran, as none of them had been submitted to any representative of this company.

On July 13 I received a letter from Mr. Moran, asking for a personal conference. I immediately invited him to confer with me on the following day, which he did. In this informal conference on July 14 I refused recognition of the union, and made it perfectly clear that this question was not open for discussion. It was agreed that if our employees had any complaints not in the course of adjustment under our Industrial Representation Plan, they should be considered at a later conference with the Colorado Industrial Commission, to include some of our employees. This conference was later fixed by the Industrial Commission to meet at the Capitol Building on July 26. On the day set for this meeting Mr. Moran and John McLennan stated that the miners refused to meet at the State Capitol, and as a result of this refusal the conference was held at my office. Up to this time no list of grievances had been furnished to the Industrial Commission, although the chairman had twice written to Mr. Moran asking for such a list.

At the conference in my office a list of alleged grievances was presented. Most of them were either trivial or so general in their nature that they contained no specific charges of injustice and so could not be investigated. Mr. Moran himself stated that the principal demand was for recognition of the United Mine Workers of America and for an abandonment of the Industrial Representation Plan. Mr. Moran proposed submission of all grievances to arbitration, including the demand for union recognition. I declined this proposition, but offered either to adjust all grievances, except the demand for recognition, through the State Industrial Commission; or to leave them to a committee composed of four employees selected by the delegates present in the conference and four officers of the company sitting with a member of the Industrial Commission as umpire; or to refer them to the State Industrial Commission for settlement. Mr. Moran declined these propositions, and stated that he was not willing to leave any matter to the State Industrial Commission, and that he was not willing to discuss further adjustment of grievances unless the demand for recognition of the union was considered. He and his associates abruptly abandoned the conference, refusing to continue to discuss the grievances that had been submitted, although urged by me to do so.

I stated the following reasons for refusal to recognize the United Mine Workers organization: (1) Such recognition would mean at least partial abandonment of the Industrial Representation Plan and Agreement which were adopted by both employees and the company, and which are proving satisfactory to the company and most of its employees. (2) An agreement with the United Mine Workers of America would apply to only a portion of the employees, while the present agreement is with *all* of them. (3) Such an agreement would be unfair to that large body of employees who prefer not to join the union, many of whom have sought employment with this company to avoid working under union conditions and who have a right to expect that the company will live up to the agreement now in force. (4) While the company stands ready to consider and adjust all grievances promptly, or to leave their settlement to the State Industrial Commission, it agrees with the position taken by the Council of National Defense that the standards which have been established should not be changed during this war when coal production is so vital to the interests of the nation, and it believes that its employees will agree with the statement of Secretary of Labor Wilson, quoted below, and which actually describes the condition in Colorado Fuel and Iron Co. coal camps:

"If you can get a condition where efforts to organize the workers are not interfered with and where a scale of wages is recognized that maintains the present standard of living, it occurs to me that for the time being no stoppage of work should take place for the purpose of forcing recognition of the union."

The Colorado Fuel and Iron Co. will continue to operate under the Industrial Representation Plan and Agreement, which it believes have been satisfactory to a large majority of its employees, in spite of the persistent hostility of union officials and organizers, who have had free access to our camp. The officers stand ready at any time to adjust grievances by the methods prescribed in this plan, which provides for final appeal in every case to the State Industrial Commission. The company is earnestly striving to protect and improve the interests of its employees.

If the United Mine Workers of America insist upon calling a strike, it will be on the sole issue of union recognition, which will not be granted. Such action would be in direct defiance of the advice of Secretary of Labor Wilson, and I confidently believe that the larger portion of our employees would refuse to leave their work. As I have already stated to the Colorado Industrial Commission, "Unless, contrary to my belief, there are serious grievances as to either wages or working or living conditions which the company officials have refused to fairly adjust, it would certainly be little short of treason to attempt to precipitate a strike among coal miners at this critical time in the history of our country."

Are Contracts with Labor Unions Property Incumbrances?

The firm of Hayden, Stone & Co. recently purchased the properties of the Victor-American Fuel Co., near Gallup, McKinley County, N. M., for the joint account of the Ray Consolidated Copper Co., the Chino Copper Co. and the southwestern department of the American Smelting and Refining Co. A new company was formed known as the Gallup-American Coal Co., and V. M. Sully, general manager of the Chino Copper Co., became general manager of the fuel concern.

When work was to be resumed on July 2, few workmen reported, the men understanding that the mines would not be conducted under the agreement recently signed with the union by the Victor-American Fuel Co. The company insisted on running open shop and did not recognize the contract of the Victor-American Fuel Co. as an incumbrance on the property, but regarded it as a personal obligation of the former operating company.

V. M. Scully declared that he would not collect union dues, but was ready at any time to discuss operating conditions with his employees. He began to discharge agitators, declaring that by intimidation they were preventing men from going to work. He declared that there were Industrial Workers of the World stirring up trouble, for one man who was arrested for boisterous conduct was found to have a card of the Metal Mine Workers' Union issued in the Clifton-Morenci district of Arizona. This union is a branch of the Industrial Workers of the World.

Apparently certain parties went even further in their efforts to make the mine workers accept the abrogation of their contracts. Several miners and Frank Hibberly, a representative of the union, were deported from Gallup to Belen, N. M., a distance of about 150 miles along the Atchison, Topeka & Santa Fé R.R. Belen is a town of about 700 inhabitants, and the men were without money or friends. They were wired \$400 by Secretary William Green, of the United Mine Workers.

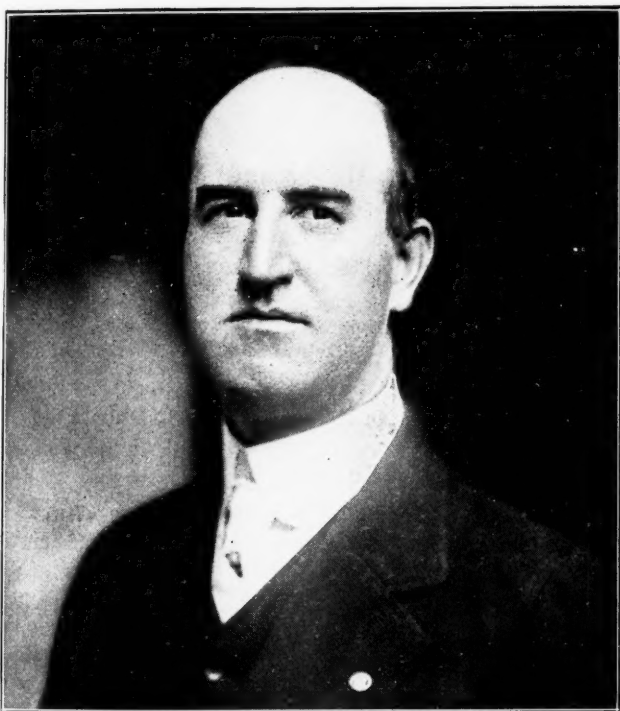
The United Mine Workers is said to have considered a general strike if action is not taken to restore the men. If the men were really deported, it appears that they have a right to redress regardless of whether the new company was bound by the old contract. Four hundred members of local union 3227, all of whom are employed by the Albuquerque & Cerrillos Coal Co. at Madrid, have decided "at the call of the national organization" to suspend work until the mine workers deported from Gallup are returned. The Gallup Southwestern Coal Co.'s men and those of the Diamond Coal Co. quit work also in sympathy with the Gallup-American deportees.

Who's Who In Coal Mining

George M. Shoemaker

The anthracite region of Pennsylvania has given to the bituminous coal fields of the country many of its most progressive engineers and coal-mine managers. One such case is that of George Shoemaker, who was born in Wilkes-Barre, Penn., in 1871, and who descended from a family of pioneers in the settlement of the Wyoming Valley in Pennsylvania.

Having only a common-school education, Mr. Shoemaker started on the engineering corps, working his way up to the position of transitman, and finally becoming chief engineer for James W. Ellsworth & Co., at Ellsworth, Penn. Leaving Pennsylvania, he went to



GEORGE M. SHOEMAKER

West Virginia, where he served as chief engineer for the New River Smokeless Coal and Coke Co., at Rush Run, on the Chesapeake & Ohio Railroad.

Mr. Shoemaker's next position was that of division superintendent for the New River Collieries Co., at Sun, W. Va., which place he held until he was appointed manager of operations under the late Neil Robinson, who was made receiver for the LaFollette Coal, Iron and Railroad Co. Later he was made manager of the coal department of the LaFollette Coal and Iron Co., a reorganization of the first-named concern. Mr. Shoemaker is now president and general manager of the Red Dragon Coal Co., with headquarters in Cincinnati, Ohio.

Up to the time Mr. Robinson and Mr. Shoemaker took hold of the LaFollette operations, the product of this company was considered an inferior fuel. Through able management and a carefully planned system of educational publicity, they created a demand for the LaFol-

lette coal by proving its value, and made it possible to reorganize the company and place its business on a profitable basis.

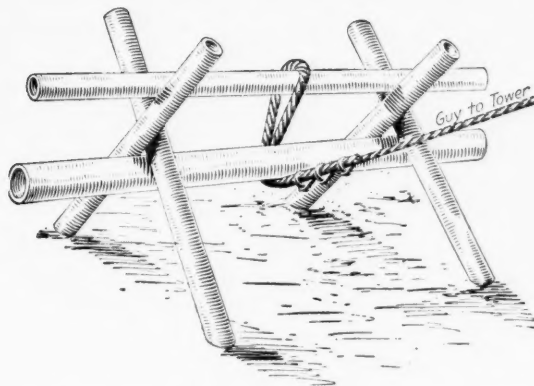
Mr. Shoemaker has taken active part in the affairs of the Southern Appalachian Coal Operators' Association, of which organization he served as chairman of the executive board. He is a member of the American Institute of Mining Engineers and belongs to the Cumberland Club, of Knoxville, Tenn. He also served nine years in the Pennsylvania National Guard as a noncommissioned officer.

Mr. Shoemaker has read papers on cost keeping, organization and coöperation before meetings of the Southern Appalachian Coal Operators' Association and the West Virginia Coal Mining Institute. He has also been a frequent contributor to the pages of *Coal Age*. His entire life has been devoted to the coal industry, and his success in his chosen profession is a source of much gratification to his friends.

Self-Tightening Anchor of Pipe

A kink used at the Sistersville filtration plant, and devised by William Francis, of Dayton & Francis, contractors, New Martinsville, W. Va., will be found useful in raising material around the mine plant. The device, which is described in a recent issue of the *Engineering News-Record*, consist of a loose-pipe horse the legs of which are of 2-in. pipe driven into the ground to form two standards, each having the form of an X. A transverse pipe is carried above the crotch of the two standards and another pipe is held in the under crotch, the guy rope being wrapped around these two pipes as shown in the illustration below.

Any pull or jerk on the guy line tends to pull the two cross pipes together and thus spread the legs of the



A PULL ON THE GUY LINE TIGHTENS THIS CONVENIENTLY BUILT ANCHORAGE

standards. This binds the upper sides of the four pipes against the holes in which they are driven.

It will be observed that it is not necessary to clamp the pipe together, as would be essential if the purpose were to construct an ordinary back-log trestle. Such a trestle, indeed, would be hard to keep from deformation. Moreover, it would be necessary to set it in an excavation, and then it would not be in solid material. The simple form of construction here suggested is made of driven pipe. It is consequently set solidly into the ground and gives almost absolute rigidity.

Editorials

"Do as I Say; Don't Do as I Do"

THE United States Reclamation Service has a lignite mine at Williston, N. D. It is run by Government officials—poor, frail, human beings like the rest of us. When we read the report of the state engineer, seeing that he acts as chief inspector, we expect to find a weary record of duties unperformed as in all inspectional reports. But the state engineer does not venture to speak ill of the Government mine. Neither shall we. We are not state inspectors, and our duties do not require it of us. We are like United States Bureau of Mines' officials. We do not upbraid, we only record.

Therefore we note here that "40 per cent. Red Cross dynamite is used," and also, if we may, that this dynamite is not recorded as a permissible powder in a recent list published by the Bureau of Mines. Then we read: "Each miner is allowed to take 25 lb. of dynamite into the mine. Two feet of coal is left for the roof. Ventilation is secured by means of two airshafts, one 2 ft. in diameter and the other 2 ft. by 6 ft. An electric fan is placed in the smaller shaft and is used only during the summer months. Another electric fan is to be placed in the larger airshaft."

This mine does not lack for expert Government superintendence; it has a general superintendent, a superintendent of power plant and mine, and a pit boss—all for about 3 miners and 2 helpers and an annual tonnage of 6618 tons, roughly 23 tons per day. Though the lignite is 9 ft. thick, the cost of production was \$1.73 per ton in 1915. The year before it was \$1.50; of this the miner got only 60c. Perhaps the difference in cost between the two years was due to the falling production, for 9972 tons was produced in 1914, and in 1915 with only 6618 tons the "overhead" charge in the Government mine must have seemed no small item. The increased cost cannot be explained by increased wages, for the rate per ton remained unchanged and the average wage declined slightly. Nor was it due to yardage, for no entry was driven in 1915. The daily wages that year lay between \$2.50 and \$3. The coal was all shot off the solid.

The output of 9972 tons in 1914 was so large that there were as many as 7 miners employed in the summer and apparently the mine worked on Sunday for it is credited with 325 days of running time. In 1915 the demand for coal fell; there were fewer men employed and the properties as to Sunday rest were probably observed. The mine ran only 283 days.

And now, to be fair, though our Congressmen and Senators never are fair when they scold the coal industry, other portions of the report may be quoted. "The conditions in and about the mine were found to be

excellent. This is the best-timbered mine in the state." It may also be added on the authority of the report that the mine had only one accident in 1914 and that not fatal. In 1915 not one of the five men employed had an accident.

Overlooking the favorable features in the story, we may say that exhibits like this keep us from the more perfect way of socialism. A mine that drives no entry and has practically no water, that works every day, that is approachable by a drift, where the longest haul underground is perhaps 400 ft., gives 60c. to the miner per ton and yet can only get coal out for \$1.73. The miner gets less than 35 per cent. of the wage paid. The rest goes for hauling, timber and overhead charges. If this were a pitching mine, if the coal had to be carefully prepared, if it had a cover of several hundred feet instead of 90, if it were badly faulted or if it worked irregularly, we might not be surprised at the relative proportions of the charges on the distribution sheet. But the conditions are all favorable, and the figures should so indicate.

This is the mine that was heralded at one time by the pamphleteer as a model for coal men to follow. We wonder how much coal costs now, if there have been two large increases in wages in North Dakota as in other states.

Aristotle urges that, in the national economy, the legislative, executive and judicial powers be kept separate, and our constitution is based on that principle.

When one of the Congressional arms, the Reclamation Service, runs a mine, the legislative body is performing an executive act. Aristotle says it will perform it badly and—it does.

Relation of a Technical Journal to Its Advertisers

A TECHNICAL journal fills quite a different field and has a widely different scope from that of a purely trade paper. While the latter discusses only commercial interests and fills its pages with notes and information that are of value in the buying and selling of commodities, a technical journal reaches and interests workers in a vastly wider field. Its province is to investigate and publish information relating to the newest ideas and inventions of modern science as applied to the industries.

The field of a technical journal is, therefore, a responsible one. The information furnished must not only be accurate and reliable, but possess another feature that will excite the interest of others than those actually engaged in the industry. This is an important function of a technical paper and one that is not always

appreciated by its advertisers to the extent that it merits. Technical data interest that large class of constructive engineers, mechanics and industrial bosses and workers who form so great an element in the success of every commercial enterprise.

It is this constructive class of readers whom the advertiser of mechanical equipment and industrial supplies should most desire to reach, and the means to this end is presented more largely in the advertising pages of a technical journal whose standing and circulation are a guarantee of the longed-for publicity.

The editorial pages of a technical journal are always open to the exploitation of worthy schemes and valuable inventions. In this regard, the advertiser of industrial wares, equipment or supplies finds in the editorial columns of the technical paper that hearty coöperation and support which he desires and should receive.

There is one feature of a technical paper that has a peculiar attraction for all its readers and particularly those who are in competition with fellow tradesmen, in supplying the market with equipment designed for the same or similar purposes. The adaptation of equipment for a specified purpose and its peculiar fitness to operate efficiently under given conditions, can be thoroughly exploited and its claims established only through the discussion of its comparative merits and the results obtained in its use or application.

The two departments of *Coal Age*, "Discussion by Readers" and "Inquiries of General Interest," have proved most useful and effective in this regard and have been utilized to such an extent by readers and advertisers alike that they have been proclaimed two of the strongest features of the paper. Their purpose is to advocate the highest possible standard of efficiency and utility, in respect to coal-mining methods and equipment. Advertisers and readers alike are invited and urged to avail themselves of the advantages of the editorial pages of *Coal Age*.

A Problem in Business Morals

OUR people are talking quite generally today about business morals. We are told they are doing a lot of thinking just now. It may be permissible to say quite a little *loose* thinking, to judge from comments in the papers and on the street. The more morals are discussed by the public the less convinced are we that they are understood.

For instance, we hear that excessive profits in war industries, being wrong, should be taxed heavily, as if large profits in war industries are any worse than any other profits in war time. Is the wage of the soldier immoral and the wage of the sutler moral? Is the conscientious objector who keeps a dry goods store any better citizen than the boy in khaki who defends his country from the violence of the enemy?

If we are going to tax profits, let us not load them all on war-worthy enterprises. Let them all be taxed together. Let us say to the industries which have prospered uniformly for years: "Because you have been allowed to levy a heavy tribute on the public for many

years is no reason why you should be exempted from doing a part now in proportion to your income."

You hear the shallow-pated argue that the industries that have profited by the war should pay for it and those that haven't, shouldn't. This is a folly. It taxes an industry not only for its success during war, but for its poverty during peace. Because the bituminous-coal industry, for instance, lost money during the last decade and went into bankruptcy is a reason for the sympathy, help, and even the commiseration of the people. The public, however, comparing bankruptcy with plenty, lays heavy taxes on those whose lot has improved and demands no new taxes whatever from those who have been steadily receiving generous returns.

Tax all incomes, normal and abnormal alike, otherwise you put a premium on the industry that has special value in peace. The war-worthy industries have their disadvantages as investments without such discrimination in taxes. Their income will largely cease with war. They will suffer severely later from their excessive stimulation. But we sorely need them now and should not fail to let them have that stimulation. As their profits grow and decay almost in a night, and as they have been obliged to buy large quantities of material at excessive prices to increase their output, why then load them with taxation in excess of that levied on peace industries? It is neither moral nor good business. In fact, there is little difference, broadly speaking, between honesty and good policy, between morality and good business principles.

There are some exceptions, however, to the general rule thus enunciated, and they make it hard to distribute taxes altogether according to income. For instance, the railroads have not profited appreciably by the war, though exceptionally war-worthy. We have deliberately kept them from making a larger profit and hampered them accordingly in doing their duty. Some industries like anthracite mines and public utilities—electric railroads and electric-lighting concerns, water-works and irrigation developments—not exactly war-worthy, but just as necessary in peace as in war, have been kept down to an even rate of income by regulation. It seems wrong not to recognize their forbearance where that quality is displayed or their plight wherever the immobility of their prices has been due to franchises and contracts that cannot be modified.

The difficulty arises from the fact that part of our industries are on a socialistic basis already and part are on the competitive system. The anthracite business has been put on a socialistic basis by big capital acting at the behest of the public. Its increases have been made proportional to wage increases.

Public utilities, on the other hand, have been put on a socialistic basis by Federal, state and municipal supervision. Others are on an inequitable basis by reason of long-time contracts. These concerns would have received war-time stimulation had not they been restrained, and it is their peculiar predicament that makes it hard to say that taxation should be proportioned solely to income and have no regard to past earnings.

Department of Human Interest

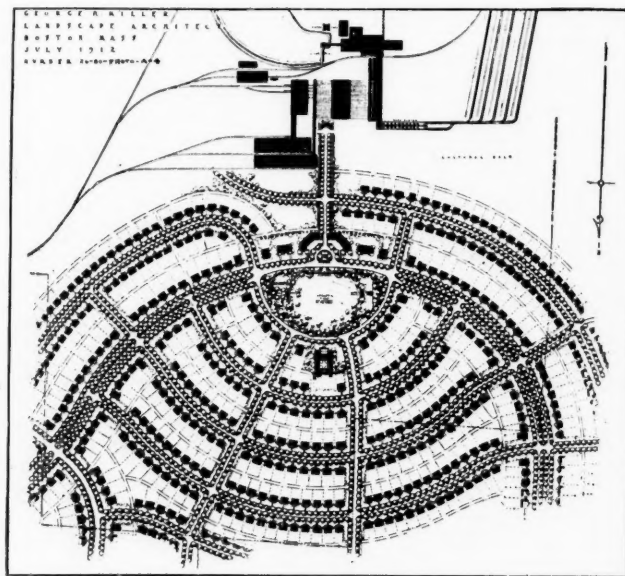
A Model Industrial Village

It must be regretfully admitted that the model village of Kaulton, on the immediate outskirts of Tuscaloosa, Ala., is not a mining town. It was built to house the employees of a lumber mill. If there is an industry where impermanent abodes have been common, it is the lumber industry. Yet the coal men largely patterned their work after the cabins of the lumbermen and forgot, in many cases, that a coal mine having a longer life than a mill warranted a larger expenditure.

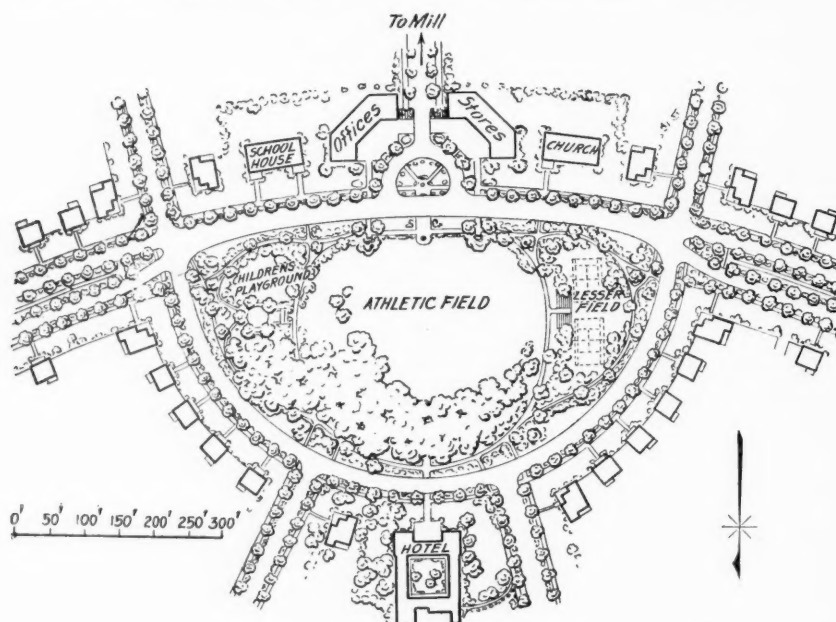
In earlier years the Hall & Kaul Lumber Co., which was in a large sense the forerunner of the concern that has built the charming village of Kaulton, owned not only many successful lumber mills in Pennsylvania, but coal mines also. They built a number of mine villages of substantial houses, with plastered and wainscoted interiors. But they were placed in long serried rows, were painted all of one color, had their long line of outhouses and their "tuckered-up-porches," which made their exteriors uninviting.

Their towns had no civic center and no embellishment, and few if any trees on the lots, and yet because the houses had an adequate number of fairly sized rooms and because they could be kept warm and comfortable they were regarded as above the average in their day. The democratic attitude of the owners of the property gave assurance that at all times they would be abreast of public sentiment and liberal in interpreting it, and there is no question but the firm of Hall & Kaul

Now, the succeeding company, the Kaul Lumber Co., has taken a leaf out of modern social development and built a lumber town with which it is hard for coal towns



PLAN OF THE VILLAGE OF KAULTON, ALA.

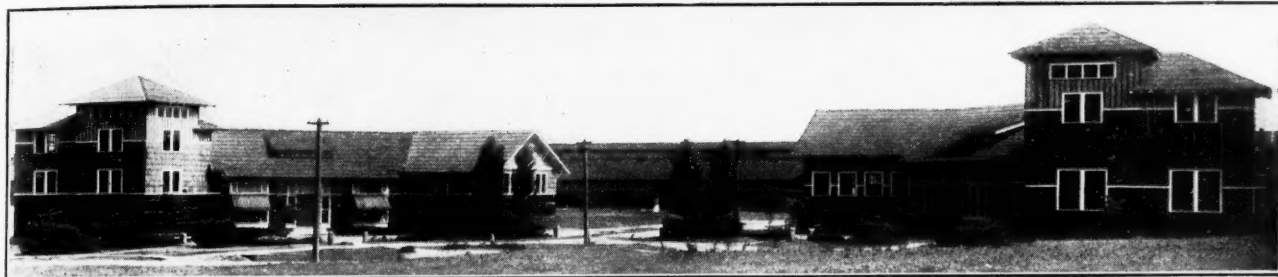


IN THE HUB OF KAULTON EVERY PROVISION IS MADE FOR COMMUNITY ENTERTAINMENT

realized its social responsibility. But the times were not then ready for such a village as Kaulton. The men who could plan it were not offering their services.

to compete. By extensive use of railroads and by reforestation lumber mills are becoming fixtures, just as by the extension of underground haulage the mining of many coal beds and the conservation of those mined it is becoming possible to plan for a long future despite the growing outputs. Kaulton is placed here as an inspiration for those who plan a town which will be a credit as long as it exists and will not merely by its attraction select the best of employees, but will have an uplifting influence on all those who are there employed. It will be noticed that the mill is shut out from view on every hand. A mill or a mine is at best more an object of utility than beauty—a place a man wishes to leave behind when he enters his home life. As a rule a mine or mill cannot be made a green and grassy spot, and so as it cannot be made an object of beauty, it may as well be excluded from view. The athletic field, the playground, the wading pool and the shelter present a counter attraction to the mill and keep the children where they belong, away from the dangers of the mill yard and pond.

The designs were made by George H. Miller, a landscape architect of Boston, Mass., who has recently planned two mining towns near Pittsburgh, Penn.



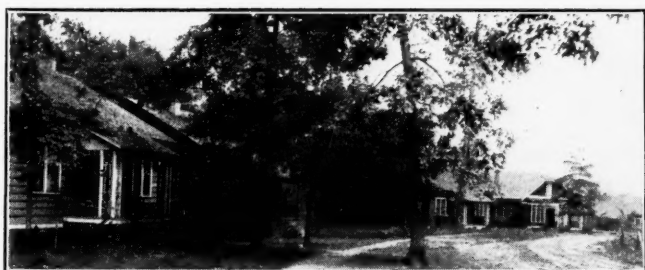
STORE BUILDING ON LEFT; OFFICE BUILDING AND CLUBHOUSE ON RIGHT



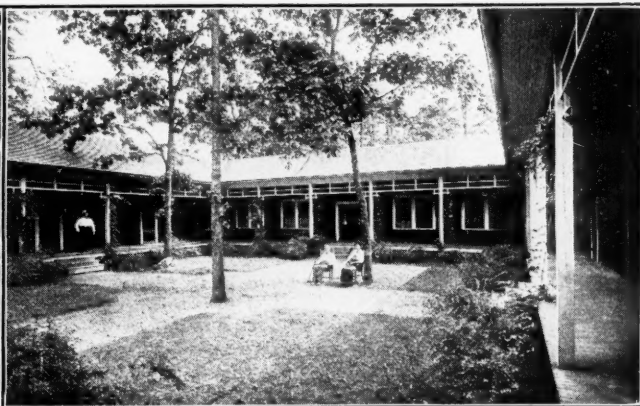
ANOTHER VIEW OF VILLAGE CENTER; WATER TOWER ONLY PART OF MILL VISIBLE



SUPERINTENDENT'S HOME ON LEFT WITH A TYPICAL SIX-ROOM HOUSE ON RIGHT



ONE OF THE VILLAGE STREETS AND THE FRONT OF THE INTERESTING HOTEL BUILDING



SAMPLES OF LARGER HOUSES AND VIEW OF THE "SPANISH PATIO" IN THE HEART OF THE HOTEL

Book Reviews

Progress of Briquetting in Europe

A HANDBOOK OF BRIQUETTING. Vol. I, The Briquetting of Coals, Brown Coal and Other Fuels—By G. Franke, professor of mining, ore dressing and briquetting, Königlicher Bergacademie, Berlin. Translated by Fred C. A. Lantsberry, head of the Birmingham Small Arms Co.'s Laboratory. Pp. xxviii + 614 + 7 index; 6¼ x 9 in.; 9 plates and 225 text illustrations. J. B. Lippincott Co., Philadelphia, Penn. Cloth boards.

This book reflects the briquetting industry as developed in Europe. It has nothing to say regarding American practice, though the Mashek machine does receive one page of somewhat inadequate notice. Perhaps to some readers a greater recommendation to the book could not be written, because it is easily possible to obtain a good store of knowledge about the American industry, whereas European methods might be covered only with difficulty.

The book was written in Germany and translated by an Englishman for the use of his fellow countrymen. It was subsequently typed, but a disastrous fire melted the type and many of the plates, and the work had to be set up again. The date of the edition of Franke's work is nowhere given. The reviewer is therefore in doubt as to the exact place of the volume in the chronology of briquetting. Perhaps taking the dates of the references in footnotes and the closing dates of production charts is an unfair method of discovering the correct time of publication. But the reviewer has been obliged to choose that method of determination. The references to other literature date to 1908, and the charts of output end in 1907, so the book was probably written in 1909. The public is always entitled to the date of the original work of which a reprint or translation is made and it should never be omitted by the publisher.

The book discusses the matter historically, also the suitability of coals of different types for briquetting, the crushing of the fuel, the warming, drying, kneading and heating of the material, the storage and loading of briquets, the design of briquet factories, the economy of briquetting and briquetting statistics. In the second section the preparation of brown-coal briquets and wet-compressed blocks is treated at even greater length and with more complete elaboration.

The references to the methods in use in the brown-coal workings of Germany will be exceedingly interesting to American readers. The author tells us that brown coal can be moved with profit when the thickness of the overburden is not more than twice the thickness of the coal. "Under special circumstances the proportion may be a little greater, but generally speaking, open working becomes too costly when this ratio is exceeded and deep working becomes essential." The greater ratios attained in this country, reaching sometimes 11 to 1, are secured by reason of the better quality of the mineral to be obtained and the lesser thickness of the mineral, the latter advantage being shown by comparing the ratios in the anthracite region with those in the bituminous. Though more overburden can be removed for thick coal than for thin, the amount is not nearly proportional to the depth of the seam, for with thick seams the overburden has to be entirely removed whereas with thin seams it can be merely tossed on one side.

The German brown-coal deposits are remarkably thick. In the Hedwig mine the lignite is from 59 to 66 ft. in thickness. It has a cover of from 39 to 52 ft. But this strip pit does not begin to compare with the Rodder pit near Brühl, where the covering is only 16 to 26 ft. thick (principally gravel and sand) and the thickness of the coal stratum is 131 ft. Could any condition be more ideal? As a drawback the coal must first be uncovered and drained and then left to dehydrate for about a year before mining.

A Comprehensive Book of Reference

HANDBOOK OF CHEMISTRY AND PHYSICS—A handy and useful volume for chemists, engineers and students, adapted to use in the laboratory or classroom. A ready reference pocket book of chemical and physical data. Compiled by the Chemical Rubber Co., Cleveland, Ohio. Fifth edition, pp. 414, including table of contents and index. Size, 4¼ x 6¾ in.; flexible, cloth binding. Price, \$2 net.

The fifth edition of this useful handbook of chemical and physical data has just issued from the press. In its new and revised form, the publishers have aimed to present in one compact, easily portable volume a comparatively comprehensive handbook of reference, which is designed for use in the laboratory or classroom, where former editions have already found a place.

The present volume is, if possible, more complete than foregoing issues. No pains have been spared by Dr. W. R. Veazey, of the Department of Chemistry, and Charles D. Hodgman, of the Department of Physics, of the Case School of Applied Science, who have selected and prepared the data, compiling it from the most recent authoritative sources, to make the present edition both comprehensive and valuable. As a result of the researches and labors of these gentlemen, the pages of this little book combine, in small compass, valuable data taken by permission from the Smithsonian Physical Tables and a few score of other technical works of recognized authorities.

In the preparation of the present edition, there have been added about 60 pages of new material, much of which has been suggested by former users of this handbook. Among the important additions are a table of the physical constants of the more common organic compounds. Also, a five-place logarithmic table has been added, which will be appreciated as materially increasing the usefulness of the book.

While there are several English and foreign works similar to the one under review, there are comparatively few books of like nature published in this country.

The United States Steel Corporation Reveals Its Methods to Industry

UNITED STATES STEEL CORPORATION METHODS FOR THE COMMERCIAL SAMPLING AND ANALYSIS OF COAL, COKE AND BYPRODUCTS. Pages 91; 6 x 9 in.; 10 illustrations. Paper boards. Price, \$1.50 net.

An unpretentious volume in a paper cover is this booklet, but it represents a great deal of labor on a subject about which not much has been written. As it is compiled by a sub-committee headed by a man who has had a valuable and extensive practice in coal investigations, and who may be regarded as one of the chief coal-mining chemists in America, it will command immediate attention from coal-mine chemists. We refer to J. R. Campbell, who has contributed some of the most thoughtful articles on the chemistry of coal which have appeared in recent years. The other members of the committee are almost as well known.

It might be added here that other United States Steel Corporation pamphlets are: "The Sampling and Analysis of Gases," "The Sampling and Analysis of Plain Steel," "The Sampling and Analysis of Alloy Steel" and "The Sampling and Analysis of Iron Ores." These all sell for \$1 a copy and can be obtained, as also the book reviewed, from J. M. Camp, chairman, Chemists Committee, Mezzanine Floor, Carnegie Building, Pittsburgh, Penn. Two other books in preparation are "The Sampling and Analysis of Slag, Cinders, etc.," and "The Sampling and Analysis of Ferro-Alloys and Bearing Metals."

Discussion by Readers

Importation of Chinese Miners

Letter No. 5—Kindly permit me to say that it is my opinion that the importation of Chinese miners, as suggested in the Foreword of *Coal Age*, July 21, would do more harm than good. I am unable to conceive how there is any need for such a step. The need, certainly, does not exist in this region.

A careful study of the situation should convince anyone that the real difficulty does not exist so much in the scarcity of good miners as in the scarcity of railroad cars for the shipment of the coal mined. In this locality the mines are only working from 4 to 6 hours a day, and some days not at all. From the account given in the article entitled "Injustice of the Short Working Day," *Coal Age*, July 21, p. 121, it would appear that there is an even greater scarcity of cars in eastern Ohio than we have experienced here in West Virginia.

While it may be true that most mines could employ more miners than they are able to secure at the present time, that would not relieve the real situation, since the mines are not working more than half the time and are unable to ship the coal produced by the men already employed.

MEANS SUGGESTED TO IMPROVE THE SITUATION

In the foreword to which I have referred, four ways are suggested of overcoming the present difficulty: (1) Be satisfied with a reduced production. (2) Increase individual output by introducing improved methods. (3) Introduce machinery and labor-saving devices. (4) Import labor. The second and third suggestions are good, and the first suggestion of being satisfied with a less production of coal is far better than the fourth suggestion of importing labor—particularly Chinese labor.

Talking over the matter with some of the miners, both Americans and foreigners, I am satisfied that such a step would lead to strikes and possibly riots and bloodshed. The labor now employed in the mines would not consent to work in the same mine or live in the same community with Chinamen, and it can hardly be assumed that such a move would meet with favor anywhere in the states.

It is stated in the foreword that "about 1100 new coal mines have been opened in the United States, in the past 15 months." Instead of improving conditions, this fact only makes the situation worse. A multiplicity of coal mines has a tendency to invite miners to drift from one mine to another in search of better work or better living conditions. It develops a roaming spirit among miners. Again, multiplying the number of mines will reduce the available car supply for each mine, increase the cost of production and raise the price of coal to the consumer.

It must be remembered that the overhead charges at every mine remain more or less constant, and the in-

ability to work full time and the consequent decrease in tonnage will raise the price of the coal shipped. These facts are worthy of careful consideration in the study of methods of improving conditions.

There is another phase of this subject, however, that strikes every true American. Being an American-born citizen myself, of military age subject to draft and facing the probability of being called for examination, the question has appealed to me, as to others, from a patriotic standpoint. I have a good wife and two nice children whom I would be obliged to leave at the call of duty. Under these circumstances, the question presents itself forcibly to one's mind. Do patriotism and loyalty require a man both to leave his home and relinquish his place in the mine to a Chinaman or even a Mexican, as was suggested by P. L. Mathews, *Coal Age*, Aug. 4, p. 195?

GREATER NEED OF AN ADEQUATE CAR SUPPLY

Let me suggest, in concluding, that it is important to adopt some measures that will provide sufficient cars for the shipment of coal to meet the capacity of every mine, so that the mines could work full time. The result would then be that the production of coal would more than equal the present demand, great as it is, for miners would work an hour extra each day, if necessary, rather than yield their places to, or come in contact with, Chinese or Mexicans.

We have engaged in a war for democracy and freedom and must all sacrifice to some extent. Why not, let me ask, curtail the shipment of automobiles for pleasure, and utilize the cars for the shipment of coal? The giving up of these and other luxuries would greatly assist in improving the situation.

DANIEL F. SMITH.
Wellsburg, W. Va.

The Negro, North and South

Letter No. 5—Having had some little experience with the negro, both North and South, I may be permitted to give my views in regard to the different treatment accorded him in these two sections of the country.

My observation convinces me that the Northern negro is far superior, in many respects, to his brother in the South. Many times I have been asked to sign the statements of negroes working in mines in the Southern States, in order that they might draw their pay. This is seldom the case at Northern mines, where most of the negroes are able, at least, to write their own names.

Someone has remarked that there are no "Jim Crow" passenger cars in the North, which is true. In addition, it can be said that there are many advantages enjoyed by the Northern negro that are not thought of in the South. In the North the negro can secure the same education as the white man. He can perform the same work and receive the same pay, and is rated according to his ability. He is even eligible to hold public office. In

many instances, the negro has become a successful business man and accumulated a bank account that would make many white men blush.

It is true there is a certain class of negroes here in the North who are not fit to work alongside of white men; but this is true also of the whites. Many white men are born with the wanderlust in their blood. They are not satisfied to settle down to steady work and have earned for themselves the appellation of "ne'er-do-wells." The best evidence of industry in any people, white or black, is the manner in which they keep their homes. It can be truthfully said that many negroes give evidence of their industry by being the proud possessors of neat, well-kept homes.

TREATMENT OF NEGROES IN SOUTHERN MINES

Let me recite here a little of my experience with the negro in the mines of the South. I was serving as fireboss in one of the large mines where both white and colored labor were employed. My instructions were to give the wet places to the negroes or "burr heads," as they were generally styled.

The negroes were never allowed to run a machine, drive a motor or do anything except to load coal and perform common labor. If there was a mean mule or a bad run, the boss driver would give it to a negro and if there was any kick the fellow was promptly discharged and told to "get out of camp at once," which he generally did with alacrity, knowing that if he stayed around he would be assisted out of town by the so-called police.

In closing, let me say that few Northern negroes return to the South, notwithstanding what has been said about the "Sunny South" being the negro's home. He realizes that the North gives him every opportunity to develop his capabilities and make good, and many are doing this. In my opinion, the South will have to experience a great change if it wishes to stay the exodus of the negro and retain his labor. OSTEL BULLOCK.

Herrin, Ill.

Carbide vs. Oil Lamps in Mines

Letter No. 3—I want to say a word in reply to the statement of John Buggie, *Coal Age*, July 14, p. 70, who expresses the opinion that the carbide lamp is a poor lamp for a driver or triprider to use, claiming that it is easily extinguished by the wind when riding on a trip of cars.

My experience of 30 years in the mines makes me fully acquainted with the difficulty of holding a light when riding a trip or driving a mule against a strong air current. I have used the carbide light since it was first introduced and want to say that Mr. Buggie should practice what he preaches and "seek improvements" that will overcome the difficulty he mentions as an argument against the carbide light.

Some two years ago or more, a wind-proof attachment was brought out, which was designed to prevent the extinction of the flame of the carbide lamp. It was a little device made to screw on the burner of the lamp and prevented the ready extinction of the flame.

Speaking of the smell of carbide dumped from miners' lamps, it is true that is not a pleasant smell, but it is

not injurious and soon passes away. The objection, however, is not important, as the miner can dump the refuse from his lamp into a car of coal, or if he spills it on the floor, he can cover it over with dust or road dirt. A little care on his part will wholly avoid the annoyance of smell.

Now, in regard to the carbide lamp not being capable of detecting the presence of carbon dioxide, or blackdamp, which is the objection most often raised against this lamp, it occurs to me that I have seen the statement, either in *Coal Age* or in a circular of the Bureau of Mines, claiming that carbon dioxide can be detected with a carbide lamp.

If I remember correctly, the statement said that the manner of detecting gas with a carbide lamp differed slightly from that employed in the use of the oil lamp. If this is true, it means that one must be taught how to detect blackdamp with a carbide lamp. Because we do not know how to do this is not to say that the lamp will not detect the gas. The trouble is, perhaps, with ourselves and not with the lamp. May I not ask that *Coal Age* give us a little information along this line and explain how the presence of blackdamp is detected when using the carbide lamp?

Olyphant, Penn.

WILLIAM H. HEMELRIGHT.

[All flame lamps are dependent, to a greater or less extent, on the oxygen of the air to support their combustion. Some flames are more tenacious than others and not affected, in like degree, by the depletion of the oxygen of the air caused by the presence of carbon dioxide or other extinctive gases.

The hydrogen flame is the most tenacious of all flames, in this respect; but, being a gas-fed flame, it is quite readily extinguished by a strong air current, which is also true of the carbide flame, though to a less extent than of the hydrogen flame. Both of these flames, however, are more tenacious than an oil flame, in respect to their dependence on the oxygen content of the air. Oil-fed flames, on the other hand, are more sensitive to the depletion of the oxygen in the air than the other flames mentioned, but oil-fed flames are not as easily extinguished by a strong air current.

Notwithstanding the difference of opinion in regard to the detection of blackdamp by means of the carbide lamp, it is still true that the lamp will burn less brightly and the flame will not be as long when the air contains carbon dioxide or the oxygen content is diminished. This effect, however, is much less noticeable on the carbide flame than on an oil-fed flame.

While the carbide light will still burn brightly in an atmosphere in which an oil lamp becomes very dim or is, perhaps, wholly extinguished, the former will always be extinguished when the percentage of carbon dioxide present is sufficient or the oxygen of the air depleted enough to produce this effect.

If no carbon dioxide is present, it is possible for a carbide light to be almost if not wholly extinguished in an atmosphere that can be breathed for a short time without fatal effect. But, on the other hand, such is the toxic effect of carbon dioxide on the human system that an atmosphere containing this gas may produce a fatal effect if breathed but a short time, while a carbide light still continues to burn. In this connection, see note at the foot of page 1131, *Coal Age*, June 30.—Editor.]

Drilling and Shooting Coal

Letter No. 3—I notice that Robert A. Marshall, in his letter, *Coal Age*, Aug. 4, p. 209, argues in favor of placing experienced miners at the working face in order to raise the standard of mining coal and make the work of miners more efficient, which would increase the output of coal and reduce the accident rate.

The question arises at once, Where are these experienced miners to come from? With new mines being opened each year, and the constantly increasing demand for coal, it has been necessary to employ a large proportion of foreign labor in the mines. This fact alone makes it impossible to secure experienced miners for any small proportion of the working places.

In the matter of timbering alone, no longer than 35 years ago miners were obliged to cut their own props before going into the mine, and they realized the necessity of timbering their places. Today, props are furnished the miner already cut to suitable lengths. What is the result? The large majority of miners are too indifferent to their own safety to set this timber that is made ready for them. The mad haste to put out more coal has made even the experienced miner neglect the precautions that he knows are necessary to insure absolute safety.

In regard to explosives for blasting coal and rock, after all that has been done to provide different grades of powder adapted to different classes of work, it is difficult to impress upon miners the need of selecting the grade of powder that will give them the best results. They fail to see that such a choice of explosives is for their own safety, and that a less weight of powder will do the same or better work than an overcharge.

NEED OF CLOSE INSPECTION OF WORKING PLACES AND INSTRUCTION OF MINERS

Now, keeping these facts in mind, my conclusion is that the proper way to get miners to shoot their coal right and to make their places safe in other respects is for the company to employ a sufficient number of men to examine closely each working place and instruct each miner in regard to what is necessary for safety. This work, when properly done, will require plenty of time. It may be necessary for the instructor to stay in a place 15 or 20 min. at a time, but the effect will be to impress the men with the idea that the company means business in the matter of making the mining of coal safer and more efficient.

A short time ago, an agent of one of the insurance companies was telling me of a trip he made with the foreman of a certain mine. He said that they went in one room and the boss called to the miner, "John, there is a loose piece of rock hanging over you; stand a prop under it and put two more over toward the rib." John replied, "All right; I fix right away," and kept on with his boring, anxious to shoot more coal.

Going through the crosscut into the next room, the foreman said to the miner working there, "Frank, why don't you set them props I told you to yesterday?" Frank replied, "All right; me fix right away," and continued loading his car.

The foreman spent about 2 min. in each place, giving his instructions or exchanging a few words with each man as he went. In answer to the inquiry of the agent as to why he did not see that the miners set the timbers

at once, the foreman replied, "For two reasons; first, there is not time for that; and second, if a man is too strict with them, they will leave and go somewhere where the boss is not so strict."

It does not require much thought to convince one that, just here, a universal law, applying to all coal-mining states, requiring a more thorough inspection of working places while the men are at work, compelling a proper use of explosives and the prompt timbering of places, and making it necessary for the safety inspector to see that his instructions are promptly obeyed, would be a long step in the direction of safety.

If such universal laws relating to safety were enforced, there would be no temptation for a miner to leave one place and seek work elsewhere because he thought he would be more free to follow his own inclinations in respect to the manner in which he performed his work. He would know that he must keep his place safe and shoot his coal properly wherever he went.

Ohio, Penn.

W. R. JONES.

Duties of Mine Examiners

Letter No. 7—Kindly allow me to refer to the letter of R. W. Lightburn, *Coal Age*, Aug. 4, p. 209. I quite agree with his suggestion that there is a growing need for universal laws to control the mining of coal in the different coal-producing states. Such general laws relating to the discovery of a danger and its removal, the efficient ventilation of the mine, the examination of roof and sides in all working places, and other items regarding safety, will greatly reduce the accident rate in mines by making men more familiar with what is required for safety.

I cannot agree, however, with Mr. Lightburn in exonerating the mine manager (foreman) from blame for the fatal accident that occurred when two men were permitted to proceed to work in their places where danger had been discovered by the examiner and reported to the foreman. The mine examiner was certainly exempt from blame, since he had placed the danger signal at the entrance to the place where he found the roof to be unsafe and reported the danger.

MINERS' CHECKS WITHHELD WHEN PLACES ARE UNSAFE

Safety would require, however, that a proper checking system should have been in use at the mine—one that would have prevented anyone from proceeding to work in a place where danger existed. In such a system, no man would be permitted to enter the mine without his body check. If his working place was not safe, his check would be taken up by the mine examiner or by the mine manager, and the man would thus be prevented from proceeding to work. Where this system is employed, it becomes the duty of the mine foreman or one of his assistants to see that the danger is removed and the place made safe before the body check is given to a man and he is permitted to enter the mine.

I do not deny that the men themselves violated the mining law in passing over the danger signal, but I contend that the mine foreman was negligent of his proper duties and failed in his responsibilities, by not providing a system that would have prevented the men from passing into the mine when their place was reported unsafe for work, by the mine examiner.

If it is assumed that the foreman gave the men permission to proceed, he is, of course, responsible for the results. It is quite true, as Mr. Lightburn admits, that there are many foreigners working in the mines who are not competent to make themselves safe, and this fact makes it all the more important that the mine officials should safeguard these men.

At the mine where I am employed there are 340 miners employed shooting coal off the solid. Although 85 per cent. of the men are foreigners and the mine has a daily output of 2200 tons of coal, there has not been a fatal accident for more than three years. The credit for this is largely due to our superintendent, who insists that the state law and a strict mine discipline be enforced by every official, under and above ground. This convinces me that the blame for the accident referred to by Mr. Lightburn must rest with the management of the mine, for not employing a proper system that would have prevented its occurrence.

J. M. RODDY.

Springfield, Ill.

Supervision in Mining

Letter No. 1—Referring to the brief statement in *Coal Age*, July 28, p. 152, regarding the reference of Francis Peabody to the employment of "a supervisor for every 15 or 20 men engaged in coal mines in Germany," let me ask, Why is it necessary to go to the mines of Germany for such an illustration when the practice of employing a deputy (working foreman) is as old as the hills in the northern counties of England?

The same practice has also been in vogue for 30 or 40 years in the Newcastle district of New South Wales and on the west coast of New Zealand, where the deputy (supervisor) lays all track and cuts timber to suitable lengths and does other necessary work for from 8 to 12 miners and loaders.

It would obviously be wrong to compare the methods used in longwall mining where a single deputy has charge of from 20 to 30 places, with four men working in each place, with work where one or two miners are working in a single room or chamber. There is no comparison to be made where the conditions vary so widely. My experience in mining coal on three continents convinces me that mining men everywhere regard their own methods as superior to all others, while it is a fact that the difference in conditions explains the difference in the methods employed for getting out the coal. In localities where coal is mined by longwall and the owner is paid a royalty of from 12 to 18c. per ton, the leaving of large pillars of coal would be regarded as a heinous offense. In other localities much coal is left in the pillars with hardly a thought of the waste. While it is the practice in some districts to draw all timber from the waste to permit a more uniform settlement of the roof, in other districts better results are claimed when the timbers are left standing as the working faces advance.

Returning, however, to the question of closer supervision of the work of miners, let me say that, in my opinion, more supervision means greater discipline and greater discipline means more stringent mining laws that will meet the needs in different districts and make the mining of coal safer and more economical.

West Frankfort, Ill.

THOMAS McDERMOTT.

Interpreting Mining Laws

Letter No. 1—A short time ago, I remember reading in *Coal Age* the account where a mine inspector prosecuted an assistant foreman for not staying to see that his orders were carried out and timbers set under a loose rock in a miner's place. The decision rendered by the court, however, was that the assistant had fulfilled his duty when he instructed the miner to set the posts needed to make his place safe.

The mine inspector, feeling the importance of enforcing the rules of safety, maintained that the assistant foreman's duty required him to remain in a working place until he was satisfied that it was made safe. The court, on the other hand, appears to have been guided by the simple letter of the law and disregarded its spirit.

The section of the Pennsylvania Bituminous Mine Law bearing on this case is sec. 6 of art. 4, which directs that the mine foreman "shall see that no person is directed or permitted to work in an unsafe place, unless it be for the purpose of making it safe." Section 24 of the same article of the law requires that the assistant foreman "shall perform the duties of the mine foreman and shall be liable to the same penalties" for any violation of the law.

While I have always maintained, as the court ruled in this case, that a foreman or assistant foreman fulfilled his whole duty when he directed a miner to set timbers in his place or otherwise make himself safe, yet I have often remained to see that my instructions were carried out promptly. In my opinion, a man should use his judgment, as much will depend on the danger that is imminent, and the known habit of the man to delay obeying any orders given him.

An experienced miner will generally realize the importance of obeying an order promptly. However, he will not always do this, but continue to load his car instead. On the other hand, an inexperienced miner is not impressed with the importance of doing the work at once. The foreman must take these points into consideration, and a true regard for safety will cause him to hold himself responsible for seeing that the work is promptly executed.

VAGUE EXPRESSION IN THE BITUMINOUS MINE LAW

An important feature of mining laws should be that their meaning be made so clear as to admit of but one construction. Another instance of vagueness in the wording of the Pennsylvania mine law is the use of the word "see." This word is used in a number of places in the law and is often misconstrued and given a different significance from that intended by the framers of the law.

For example, sec. 9 of art. 4 requires that the foreman "shall direct and see that the rooms and entries are moistened by water; . . . shall direct and see that the dust is loaded and taken out of the mine as often as necessary; . . . shall direct and see that, as the miners advance in their excavation, all dangerous and doubtful pieces of coal, slate and rock overhead are taken down or at once carefully secured."

In this case, the actual letter of the law would require an absurd and inconsistent performance on the part of the mine foreman, who is authorized by sec.

10 of the same article to "employ a sufficient number of assistants to insure a visit to each working place, either by himself or by his assistants, once each day while the employees are at work." It would seem that a more suitable word than "see" should have been employed. It would suffice to say that the mine foreman shall direct, instead of "direct and see."

Again, referring to the last paragraph of this same sec. 10, art. 4, the law requires that "each assistant mine foreman shall make a report in a book provided for that purpose," but does not state that the assistant shall sign such report, which may be understood as being implied. But even this interpretation is open to some criticism, because the same paragraph continues, "The mine foreman shall read carefully the daily report of each assistant mine foreman and shall sign the report with ink not later than the day following."

There have been numerous changes made in the bituminous law since the revision of 1911, and a mine foreman or assistant foreman is often ignorant of what the law actually requires. I would like to ask if there has been any change made in regard to the time of the meeting of the examining board for mine inspectors, which sec. 2 of art. 19 of the law makes "the first Tuesday in March." Circumstances were such that I was prevented from attending the recent examination, which was held this year on the second Tuesday of the month, March 13, instead of the first Tuesday as the law requires. Is it not time for the bituminous law to be revised and made more definite?

OLIVER YOUNG.

Nu Mine, Penn.

Back to the Mines

Letter No. 7—It has always seemed strange to me that the bituminous mine operators have not more generally followed the practice that has been so common in the anthracite region and which has resulted in practically tying the men to the mines where they are employed and where many of them have served a goodly portion of their lives. The practice has grown up almost unconsciously, and neither the coal operators nor their men have realized the importance it has been to the success of anthracite operations. It originated about as follows:

Some years ago, John Smith opened a mine in a tract of land that he owned. The first year or so he employed from 30 to 50 men. Many of these men being married and having families, it was not long before they began to feel the need of living nearer the mines. Mr. Smith devised the scheme of dividing his land into a number of small plots, which he offered to sell at a reasonable figure to those who wanted to buy. The result was that most of the men in his employ soon had a little plot of their own, for which they were permitted to pay on the installment plan.

A few years proved the wisdom of this scheme, as the men became attached to the place and felt a home interest in the development and operation of the mine. Today, the descendants of those men who bought their little homes from Mr. Smith are working for the mining company that purchased the Smith mine some 20 years ago. Not only did Mr. Smith make it possible for the men in his employ to own their own homes, but he set

up a small store and sold them the necessities of life at a reasonable profit.

The incident shows that the man who owns his own home is more likely to think twice before he makes up his mind to move to another place. He is a more stable employee than the man who rents a company house. I believe that if the coal companies of the bituminous field would adopt this plan and sell a plot of ground at a reasonable price to such employees as desired to make themselves a home, it would have the effect of keeping good men from wandering from place to place.

Not only is the man who is paying for his home likely to remain there, but he makes a better citizen and takes more interest in building up a good community than the man who has only a passing interest in the place. Let this principle of fellow interest and help extend, and a new era will begin with the end of the war that will be marked with greater harmony and coöperation, and this will insure a larger measure of success in every industry.

Nanticoke, Penn.

W. A. BARRETT.

Letter No. 8—I was quite impressed with the closing words in the letter of W. H. Noone, *Coal Age*, June 23, p. 1088. Writing on this subject, Mr. Noone places great emphasis on the beautifying of mining towns, as being a strong factor in bringing men back to the mines or, rather, keeping them there.

Having recently traveled through several mining towns, including Thomas, W. Va., from which Mr. Noone writes, I am satisfied that there would be needed a great transformation to develop what he has styled the "City Beautiful." Although I observed many well-kept mining towns where the buildings were freshly painted and in good condition, I could not apply that term to any of these places. I would describe them simply as a clean mining town.

WORKING CONDITIONS MUST BE ATTRACTIVE

To the credit of those companies whose efforts have made possible the clean, tidy appearance of their miners' houses and surroundings, it must be said that they have also exerted themselves along other lines than merely beautifying the place by employing garbage men to clean up the streets and collect rubbish, and a gang of carpenters to make necessary repairs and rebuild broken fences and wornout porches. These companies have realized that, in order to make a place attractive to the bone and sinew that make coal mining a success, the working conditions must be attractive and the equipment up to date. Mining operations, today, must be based on the principle of equality. Competition for advancement must be fair and based upon merit only.

As far as the "city beautiful" idea is concerned, prizes can, and should, be offered for the best-kept yards, gardens and lawns. It will be an incentive for men to coöperate with the company in maintaining a neat and tidy appearance. But, to keep the men at home and bring back those who have gone in search of better conditions, there is needed the greater stimulant of kind treatment and equality of working conditions, besides the advantages of suitable places of amusement for leisure hours, and good schools and churches. Workmen should be treated with the utmost cordiality and fairness, and this will make a mining town attractive.

West Leisenring, Penn.

ROBERT W. LIGHTBURN.

Inquiries of General Interest

Mining Students Puzzled

In the study of coal mining, the student is often at a loss to reconcile the statements of men who are supposed to be recognized authorities in the mining world. Not only do these statements frequently disagree with each other, but it is often impossible to reconcile them with one's practical knowledge and experience.

In some instances, it is true, the discrepancy may arise from an ambiguous expression that makes the meaning intended to be conveyed quite uncertain. In the majority of cases, however, no such explanation is possible, and the necessary conclusion is that the statements differ radically. Few things are more discouraging to one who is seeking reliable information than to be thus confronted with conflicting statements by supposed authorities. In his dilemma, he turns to textbooks only to find that his troubles are just beginning.

As a last resort, the student decides to write to some technical journal for its opinion. Many times, such inquiries are inserted in the columns of the journal and left for its readers to answer according to their own knowledge and opinion. The practice of *Coal Age*, in answering these inquiries editorially, besides inviting discussion by its readers, is gratifying. Most correspondents are prone to think that their way is correct. They are quite oblivious to the fact that others may view the question from another angle and reach a more accurate solution.

The following instances, cited at random, will serve to illustrate the confusion caused by misstatements that misguide the student:

In Volume 19 of the *Science and Art of Mining*, p. 327, W. H. Hepplewhite, one of His Majesty's inspectors of mines, is reported as stating, in an address delivered before a gathering of mining officials, that a fireboss in going his rounds should proceed against the air rather than walk with the current. This would seem to be at variance with good practice, which is to begin the examination of a mine on the first of the air and proceed with the current.

Again, he is said to have stated that air is lighter the less vapor it contains, and, as a consequence, the burden or strain on the fan will be less the drier the air in circulation. We are taught, on the contrary, that the more vapor present in the air the less will be its weight, for the same volume, saturated air being lighter than partly saturated or dry air, volume for volume.

Another statement was to the effect that it is the habit of gas (presumably marsh gas, CH_4) to depart from the air current and accumulate in cavities in the roof or other void places.

W. E. Garforth, whose name is well known on several continents, is quoted as saying that, "Coal dust will not rise into a ventilating current, unless a velocity of 18 miles per hour be attained," which hardly seems in

keeping with what we have learned of the nature of fine dust floating in the air current in the mine.

Before closing, I want to refer to the accompanying diagram, which appeared in *Coal Age*, Vol. 4, p. 655, showing the per cent. of correction to be applied to anemometer readings, at different velocities. It was explained that the instrument was calibrated to give exact readings, for a velocity of 500 ft. per min., but the dial reading would be in excess for higher velocities and

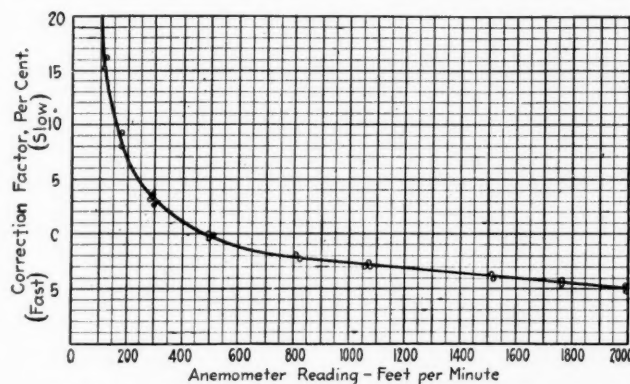


DIAGRAM FOR CORRECTING ANEMOMETER READINGS

fall short for lower velocities. Thus, a dial reading of 2000 ft. per min., it was claimed, should be reduced by 5 per cent., which makes the actual velocity 1900 ft. per min., while a dial reading of 100 ft. per min. must be increased 20 per cent., making the actual air velocity 120 ft. per min. This hardly corresponds to my previous understanding and use of this instrument.

Nanaimo, B. C., Canada.

W. H. MOORE.

It is well known that good authorities frequently differ on important subjects. However, it is never well to take the printed reports of an address as giving the exact language of the person speaking. There are too many chances of error. The person reporting the address may have misunderstood the speaker; or the printed report may contain a typographical error. First-hand information is the only sure basis on which to found criticism of a man's statement.

We quite agree with the correspondent in his criticism of the three statements credited to Mr. Hepplewhite, which can hardly be assumed to be a correct quotation, inasmuch as he is a well-informed mine inspector and a mining man of long experience. The statement credited to Mr. Garforth, if correct, may refer to the wet coal dust or some other special condition; but, standing alone, is open to criticism.

The diagram showing percentage of correction to be applied to anemometer readings, for different velocities, is the result of a series of test calibrations of the Biram anemometer, performed by the Bureau of Standards at Washington, and should be taken as correct. In actual practice in mine airways, it is a difficult matter to make a reliable test of the readings of this instrument.

Examination Questions

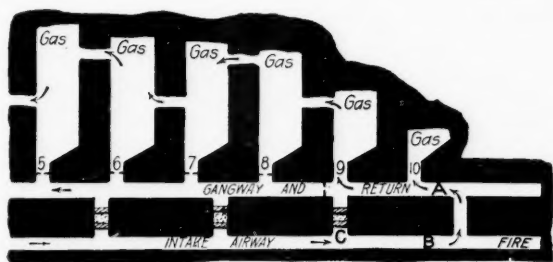
Miscellaneous Questions

(Answered by Request.)

Ques.—A fire is discovered in the face of an airway. There are 10 chambers working on the gangway, and these are giving off explosive gas. The air current enters the airway and returns through the gangway and the chambers to the main return aircourse. How would you proceed to extinguish the fire with due regard to safety?

Ans.—In this case, there is less danger of the gas generated in the chambers reaching the fire than if these chambers had been driven off the airway. Assuming that the fire has not gained such headway but that it can be confined to the space beyond the last crosscut and that, owing to a lack of water-supply, it has been decided to seal off the fire, a stopping should be built on the airway, just inside of the last crosscut, if it is possible to reach and work at this point.

Assuming the conditions shown in the accompanying figure, however, if it is impossible to build the stopping



HANDLING A FIRE AT HEAD OF INTAKE AIRWAY

inside of the last crosscut, as just stated, it will then be necessary to build two stoppings, one on the return just inside of the mouth of the last chamber, at the point indicated by A, which will prevent the gas generated in that chamber from reaching the fire. This stopping should be started and built first.

At the same time, an opening should be made in the stopping marked C, opposite the mouth of room No. 9, so as to short-circuit a portion of the air at this point. Sufficient air should be allowed to flow through the last crosscut, however, to supply the men with air while building the stopping at A. If, as shown in the figure, there is no breakthrough as yet between chambers 9 and 10, it will be necessary to arrange a brattice so as to deflect the air flowing through the crosscut at C, and cause it to sweep away the gas accumulating in the last chamber.

Before closing the stopping at A, another stopping should be started on the airway inside of the crosscut C and as near to the seat of the fire as practicable. When nearly completed, the stopping at A should be closed first and then that at B. The work should be done as rapidly as possible, and only safety lamps must be used. Some will prefer to locate the stopping A in the last

open crosscut, instead of in the gangway, as shown in the figure. This would prove the better location if the heat of the fire will permit the work to be done in the crosscut, as it will isolate the head of the gangway from the fire and prevent this space being filled with gases generated by the fire. The usual vent pipes should be built into each stopping near the roof, so as to provide for the testing of the air behind the stoppings from time to time.

Ques.—How would you remove and prevent the accumulation of explosive gas on falls, in pillar workings?

Ans.—It is necessary to erect a special brattice, in this case, so as to deflect the air current to the top of the falls and cause it to sweep the cavities in the roof. The work is often dangerous, and it is frequently difficult to remove gas accumulated on large falls. When this has been accomplished, care should be taken to arrange the brattice, from time to time, and prevent the further accumulation of gas above the falls.

Ques.—Why is the core of an armature always laminated?

Ans.—The purpose of the laminations in the core of an armature is to avoid the formation of eddy currents that would otherwise oppose and destroy the efficiency of the action of the armature.

Ques.—A gravity plane has an inclination of 8 deg.; it is 2000 ft. long, the rope weighs 4000 lb., a loaded car, 3000 lb., and an empty car, 1800 lb. What number of cars must be in the trip to start it?

Ans.—The solution of this question depends on the ratio of live to dead load, or the ratio (r) of the weight of coal in a single car (w_c) to the weight of two cars ($2W$). In this case, the weight of two cars is $2 \times 1800 = 3600$ lb., and the weight of coal in a single car, $3000 - 1800 = 1200$ lb., which gives for this ratio

$$r = \frac{w_c}{2W} = \frac{1200}{3600} = \frac{1}{3}$$

Another important ratio is the ratio r_1 of the weight of the rope (w_r) to the weight of two empty cars ($2W$). The weight of the rope, in this case, being 4000 lb., the value of this ratio is

$$r_1 = \frac{w_r}{2W} = \frac{4000}{3600} = \frac{10}{9}$$

Then, calling the number of cars required to start the trip n ; the angle of inclination of the plane a ; and the coefficient of rolling friction $f =$ say 25 lb. per ton of moving load, or $f = 25 \div 2000 = 0.0125$,

$$n = \frac{r_1(\tan a + f)}{r(\tan a - f) - f}$$

Substituting the given values, we have, for the number of cars required to start the trip, in this case,

$$n = \frac{10/9(0.1405 + 0.0125)}{1/3(0.1405 - 0.0125) - 0.0125} = \frac{0.17}{0.0302} = 5.6$$

In this case, therefore, six cars will be required to start and maintain motion on this gravity plane.

Coal and Coke News

Harrisburg, Penn.

Coal operators and coal dealers of Pennsylvania are likely to be the first against whom the drastic provisions of the food and fuel control bill will be enforced. Under authority granted in this bill by the Pomerene amendment, the trade commission, by direction of the President, has the power to take over the coal properties.

It is stated here that the Federal Trade Commission has been directed to leave nothing undone to bring offending and money-grasping coal dealers and associations to terms. It is also learned that the commission has been told that it needs no further authority from the President in order to apply the most drastic action permitted under the Pomerene amendment to coal men and operators' associations who will not yield to reason in this crisis.

Coal men here have gained the impression that the board can go the limit, if, in any case, its judgment dictates that seizure of coal mines is warranted.

The President is declared by close official associates to be thoroughly aroused over facts disclosed with reference to some of the coal men in the investigation into costs conducted by the trade commission. Much of its exhaustive report already has reached the president, and it is declared to disclose that coal prices are not only abnormal, but in many instances, outrageous under existing conditions.

Several coal associations, it is declared, are under particular investigation and are said to have met the trade commission with an attitude of defiance. On the other hand, some of the coal men have demonstrated unusual patriotism in aiding the commission.

Now that the food bill has been signed, it is declared the trade commission is going to confront the coal producers with a set of conditions upon which prices and contracts will be based. If any then show defiance, it is stated "they are going to get trouble, and get it quick."

Reports have been received here to the effect that Morris Williams, president of the Susquehanna Coal Co., which recently disposed of its hard coal properties to the M. A. Hanna company, had resigned and would hereafter devote himself to his bituminous coal interests in the West Virginia-Kentucky field.

It is understood that Mr. Williams' successor has not yet been named by the Hanna interests and it is possible that none will be chosen until the completion of the transaction with the Pennsylvania R.R. It is stated that the Pennsylvania Railroad Co. still holds the Susquehanna stock, but that when the proposed liquidation plan is completed the railroad company will receive a cash consideration and the stock will be canceled.

While the Hanna interests have taken over all the coal-producing property of the Susquehanna, they did not purchase the barge lines operating from the Pennsylvania R.R.'s Atlantic terminal in New Jersey to New England, nor did they buy the Chicago piers. The exception of the New England barge lines from the purchase agrees with the general understanding that the new owners will ship a large part of the output to the West.

The passing of Morris Williams from the hard-coal industry removes a man who has long been a leading figure. For 33 years he has been with the Pennsylvania R.R.'s coal companies, and for 14 years has been the president of the Susquehanna Coal Co. Starting in as a breaker boy in Wilkes-Barre, he attracted the notice of his superior by his ambition, and from being a driver he was promoted to the engineering department. Passing through all the grades he was made chief engineer for the Mineral Railroad and Mining Co., a Pennsylvania subsidiary, at Shamokin, and after a short service became superintendent of the Shamokin-Mt. Carmel district. From there he was transferred to Wilkes-Barre as general manager of the Susquehanna and succeeded General Wister as president of the company in 1903.

It is stated that the office at Wilkes-Barre will be maintained, and continued in

charge of Robert A. Quin, as vice president and general manager, which position he has held for many years.

Plans are being prepared to ask the people of the state to lend a hand in the nation-wide movement for the conservation of coal that is headed by the National Council of Safety and Defense, and that is considered an important matter in the winning of the war. The coal waste among householders of the country is tremendous and every pound wasted means that much less for munitions plants, ships and other vital industries.

The plan to be followed will probably be to send letters to every householder, explaining how coal may be saved by proper burning. Defects in flues or chimneys, broken drafts, broken grates, improper care of the stoves and furnaces and many other matters enter into the coal waste and this waste is a drain on the householders' purse as well as on the strength of the nation.

Incorporation of coal companies continues at a rate never before equalled in the history of the state. The last month and a half has seen more than 50 concerns granted charters to either deal in coal lands, to mine coal or to handle it. Virtually all of these companies, like those incorporated earlier in the year, are in the soft-coal fields, Fayette, Westmoreland, Cambria and Allegheny counties having the bulk of them. Some of the companies have incorporated for unusually large amounts.

With the withdrawal of troops from the coal regions, the military guard for industrial and coal properties that began with the declaration of a state of war last April has ended. The companies operating coal mines and power stations now face a problem of policing their own properties, as it has been announced that no troops will be available for this purpose, although a portion of the New York State guard will be sent into Pennsylvania.

The large coal companies have been quick to realize the situation and during the recent past plans for a complete police system have been formulated. Police officers have been secured from forces in various municipalities throughout the coal regions. These men are under the guidance of police experts who have seen duty in the regular army and some will receive instructions from the state police force. These men are whipping the recruits into shape and the coal properties are now being placed under a heavy and efficient guard.

Anthracite operators regard the determination of the Federal Trade Commission to prosecute if coal is advanced more than 10c. a ton after Sept. 1 as a threat aimed more at the retailers than at the producers. The contention of the anthracite men is that if the product is advanced more than 10c. the responsibility will rest with retailers and not with the producing companies.

The president of one of the large anthracite companies stated on Aug. 13 that this announcement of the commission is aimed at the retailers. Coal companies have filed their price schedules with the commission for the month of September, and nothing more than the customary advance of 10c. a ton has been contemplated. April prices are advanced 10c. a ton each month and in September the winter price of coal goes into effect, this being the last month in which the 10c. advance is added.

He stated further "conditions at present are unusual. No company can figure what its production costs will be for October. By that time there may be a great shortage of labor. However, there has been nothing done toward setting a price for October, but there has been no thought of an advance. The retailer has been taking advantage of conditions. He has sold where he could get the biggest price. It is to guard against such a plan that I believe the commission has made its threat of arrest. That the threat, while it applies to us, is not meant for the producer is my belief."

John E. Lloyd, president of the Philadelphia Coal Exchange, is quoted as saying that the statement of the Federal Trade

Commission that increases in the price of coal of more than 10c. a ton on Sept. 1 will constitute "profiteering" is not considered by him as directed to retail coal dealers, but to mine operators and wholesalers.

"If the operators raise the price to the retailers the retailers must naturally raise the price to the consumer. If the operators do not raise the price, the retailers will not raise the price. And, likewise, the extent to which retailers will raise the price will be governed entirely by the increase demanded of them by the operators. I do not see any reason at this time why coal prices should be increased more than 10c. a ton on Sept. 1, but, as I say, the question is not one the retailer can answer. He, like the consumer, is in the hands of the operator."

Practically all of the big coal operators believe in the policy adopted by Mr. Richards, president of the Philadelphia & Reading Coal and Iron Co., namely, that the best way to keep down the cost of coal is to keep the market stocked as much as possible, and thus prevent panic-stricken buyers from bidding up prices.

PENNSYLVANIA Anthracite

Shenandoah—The Lehigh Valley Coal Co. has inaugurated double shifts to increase the output at its Centralia collieries.

Schuylkill—Coal companies operating in the Schuylkill district have commenced operation of washeries under 24-hr. service to provide for increased output. It is said that if sufficient workers can be secured the plants in the Hazleton section will operate similarly.

Hudon—The Lehigh Valley Coal Co.'s Storage plant here is empty, and indications are that little or no fuel will be placed there during the next year, owing to the extraordinary demand.

Hazleton—Owing to the scarcity of labor the No. 12 stripping of the Lehigh Valley Coal Co., has been forced to suspend indefinitely. The men have been transferred to other workings. This is the first case where it has been necessary to shut down an operation in the Lehigh district because of the lack of hands. Coal companies are confronted with a serious shortage of men because of the munition factories and the army draft.

Weissport—The Lehigh Coal and Navigation Co. is preparing to dredge the three-mile dam at Lockport, where a structure is being erected in which to prepare for market the coal which will be taken from the water. A large and modern dredge is being built at the local boat yard at a cost of \$30,000, and it is calculated that at least 200,000 tons of coal can be recovered. Heretofore, the Lehigh Coal and Navigation Co. has been leasing the rights to dredge the dams. The coal was washed down the river many years ago when there was great waste in mining methods.

Pottsville—As a result of the heavy rainfall on Aug. 8 and 9, many collieries were forced to suspend operations as the storms in this region raged with exceptional force and considerable damage resulted to mining property. In the Lehigh region a section of the Lehigh Valley R.R. tracks was washed out, causing the suspension of several collieries for the day.

Seranton—While carrying a keg of powder on his shoulder at the start of work on the morning of Aug. 8 in the Dodge mine of the Delaware, Lackawanna & Western Railroad Co., John Reddie, aged 48, accidentally allowed the tin keg to come in contact with a mine trolley wire, resulting in an explosion. Reddie and three other men were badly burned. There was no serious damage done to the mine workings by the explosion.

Bituminous

Washington—Small-coal mine operators will probably have to go before the Public Service Commission to adjust differences between them and the railroads. The Houston Coal Co., near here, which mines and hauls its coal to Houston to be loaded on cars, has been notified by the Pennsylvania railroad that no more cars will be furnished,

and has shut down. Other small operators are in the same predicament. One reason given by the railroads was that the operators who haul their coal in wagons and load it on cars keep the cars tied up for too long a time.

Connellsville—Estimated production of coke for the week ending Aug. 11 amounted to 335,073 tons, production exceeding shipments by about 11,000 tons.

Pittsburgh—In order to insure an adequate fuel supply for Canada, capitalists of that country are contemplating the purchase of coal lands in the United States and the opening of new mines. Thousands of acres of coal in the Pittsburgh district are expected to be optioned within the next few months. Old mines will be reopened and new ones started by Canadians. More than 21,000,000 tons of coal, 16,000,000 tons of bituminous and 5,000,000 tons of anthracite will be required by Canada during the present year, and it is said that many inquiries for Pennsylvania coal lands have been received from Canadians by coal-land dealers of Pittsburgh within the recent past.

Uniontown—Receivers for L. W. Semans closed the third sale of coal lands to the Pittsburgh Coal Co. recently. This land lies in Amwell Township of Washington County and consists of 3254 acres, approximately, of Pittsburgh vein coal and 300 acres of surface. The consideration was \$1,700,929. The two other purchases totaled \$768,385 and included 2695 acres. Another sale is pending to the Lilley Coal and Coke Co., of Washington County.

WEST VIRGINIA

Huntington—The Sterling Block Coal Co. recently loaded its first coal from the new mine at Allman, on Horse Creek in the Little Coal River district. This firm is here developing a 750-acre tract of coal land. W. C. Sharpe is president and R. B. Waldron, secretary and treasurer.

Omar—The Omar Coal Co., recently incorporated with an authorized capital of \$500,000, has taken over and consolidated a number of important coal properties and operations in the Island Creek region of Logan County. The property involved was that of the Island Creek Superior Coal Co. and various properties held jointly by Dr. E. C. Jones, A. J. Dalton, J. A. Kelley and E. C. Bearss, including improved real estate and a new tippie, which has just been placed in operation. It is expected that the daily loading will soon reach 40 cars.

Wheeling—Fourteen thousand men are needed immediately in the coal fields of West Virginia, according to the State Labor Commissioner. The operation of many of the largest mines in the state is curtailed by the shortage of labor. It is believed that conditions will become worse when the selective draft army is called into service. The Federal child labor law, which will soon become effective, will cause about 3300 boys to give up their jobs in and about the mines.

Clarksburg—It is said that practically all the large coal and gas companies in northern West Virginia will request the district draft board to exempt their employees from service in the army on the ground that they are engaged in an industry vitally necessary for the success of the war. Representatives of these firms have been obtaining the draft serial numbers of their employees, together with other information from the local draft headquarters. These companies are feeling the shortage of labor keenly, and it is said that they will be unable to run anything like full capacity if all of their men that have been drafted are mustered into the army.

Fairmont—It was decided at a recent conference between Earl Henry, chief of the Department of Mines, and officials of the Jamison Coal and Coke Co., that as a precautionary measure, the No. 7 mine of that company, which exploded last October, should be flooded before further work of reclaiming the mine was proceeded with.

Montgomery—The Walnut Coal Co. owned and operated by C. D. Backus, near Vaughn, is the latest mine to begin shipping coal on the Gauley branch of the Chesapeake & Ohio. The output of the new mine will be between 200 and 300 tons per week. The first cars left the mine recently.

ALABAMA

Birmingham—A large number of negroes who left this district to secure employment in the North and West during the past year are now returning and seeking work at the coal mines and industrial plants. It is understood that hundreds of others are ready and anxious to return South, the only hindrance being a matter of transportation.

TENNESSEE

Sequatchie—The C. F. Crane Coal Co., with holdings of about 1000 acres of coal lands near Dunlap, Sequatchie County, has inaugurated a novel system of conveying coal down the mountain side. It is using a sheet iron chute instead of the usual incline. It is diverting a stream of water into the chute and will rely on the water to convey the coal to the bottom in good condition and at the same time wash it. Small quantities of coal already are reported to have been shipped by this company.

KENTUCKY

Fleming—The first shipment of coal was recently made from the new plant of the Acme By-Product Coal Co. destined to the markets of the Northwest and the Great Lake region. An increase to ten cars daily will be made within the next 30 days. Five cars are now being mined daily.

Wayland—Splendid progress is being made on the construction of the Long Fork Branch of the Baltimore & Ohio R.R. into the headwaters of the Right Fork of Beaver Creek north of here where extensive coal fields are to be opened.

Whitesburg—Two serious wrecks on the North Fork or Eastern Kentucky Division of the Louisville & Nashville R.R. during the past week greatly delayed coal shipments from the Elkhorn field and operators were handicapped to a marked extent. There have been a half dozen wrecks in this region within the past month.

OHIO

Athens—The holdings of the Ohio Collieries Co. have been disposed of to the Blaire & Harshall Co., of Shawnee, O., 666 acres of coal land in Saltlick township being involved. The new company is planning to open three mines on the property, giving an aggregate production of considerable volume.

Canton—The Edgefield Coal Co. of this city, has opened a new mine near Waco, O., with a present capacity of 75 tons a day, to be increased later to about 500 tons a day. Machinery for this purpose is being installed. The bed being mined averages 4½ to 5 ft. thick.

INDIANA

Terre Haute—Federal agents are investigating the report that I. W. W. representatives are active among the miners of the Clinton coal field, where 3000 men went on strike on Aug. 2, ostensibly because a railroad company failed to furnish satisfactory coaches to transport the workers. Reports on curtailment of production have been sent to Washington.

Evansville—Mayor Benjamin Bosse has leased 640 acres of coal land between Evansville and Chandler, Ind., and will open a coal mine to be conducted as a municipal project. He is appealing to the Indiana Public Service Commission for authority to operate the mine and in the event permission is declined says he will ask for special legislation. He proposes to supply the city institutions and the schools from the projected mine and, if the output is sufficient, to sell direct to consumers.

ILLINOIS

Benton—The Hart-Williams mine, taken over about a year ago by the Taylor Coal Co. of Chicago, passed back to the Hart-Williams Co. recently after the Taylor Coal Co. had succeeded in putting the mine in first-class shape, whereas when it took it it was a total wreck. The former owners, bankrupt, sued to recover under a technicality, and won.

Belleville—The roof of the abandoned Ebel coal mine in the northern part of Belleville caved in a few days ago, swallowing up Richland creek. Several homes are near the cave-in. There have been other cave-ins in the same neighborhood, but this is the most serious that has occurred.

The Superior Mining Co. has filed suit in the Circuit Court here against the White Coal Co. to compel it to sell to the Superior company the Valley Mine for \$35,000. It is alleged that an agreement was entered into for the sale of the mine at that price but that the White company repudiated the contract when war prices gave increased value to the property.

William A. Forrester, of Nashville, Tenn., has resigned a responsible position to become chief engineer for the Mayking Coal Corporation at Mayking, Ky. Mr. Forrester has entered upon his new duties.

L. Epperly, formerly with the Ethel Coal Co., which has been sold to the Cleveland Cliffs Iron Co., is now general superintendent of the Mallory Coal Co., which is making developments on Huff Creek, near Logan, W. Va.

Capt. E. L. Bailey is now putting in a large coal plant on the Taylor property near Stone, Ky., and it is said that he is anticipating taking over the Gates & Hatfield lease on Coeburn Fork and a large part of the William M. Smith tract on Mullins Fork.

L. C. Emmons, of the Emmons Coal Mining Co. has been chosen president of the export and import department of the Quaker City Supply Co. This branch, which will be a separate organization, is controlled by the Emmons Coal Mining Co., and quarters have been taken in the Land Title Building, Philadelphia.

James Bagley has been reappointed by Governor Lister as state mine inspector of the State of Washington for another term of four years. Although not required to by law, Bagley took the examination and was given a grade of 98 per cent. by the examining board, the highest mark given any applicant for the position. D. C. Botting did not take the examination as was previously reported in "Coal Age."

John S. Barton, lately general manager of the Minudie Coal Co., Minudie, N. S., has accepted the position of general superintendent of a new concern about to operate at Grand Lake, N. B. The seam is about 30 in. thick, but Mr. Barton has already operated measures as low as 20 inches.

Obituary

E. D. Gregory, auditor of the Philadelphia & Reading Coal and Iron Co. at the headquarters in Pottsville, died on Aug. 6 after several months' illness. He was 55 years old, and is survived by his widow and three children.

Trade Catalogs

Erie Revolving Shovels. Ball Engine Co., Erie, Penn. Bulletin S-16. Pp. 16; 8½ x 11 in.; illustrated.

Wire Rope. Macomber & Whyte Rope Co., Kenosha, Wis. Catalog M. Pp. 128; 6½ x 10 in.; illustrated.

Storage-Battery Locomotives. The Iron-ton Engine Co., Ironton, Ohio. Bulletin No. 11. Pp. 24; 6 x 9 in.; illustrated.

Sullivan Rotator Hammer Drills. Sullivan Machinery Co., Chicago, Ill. Bulletin No. 70A. Pp. 24; 6 x 9 in.; illustrated.

Electric Fans. Sprague Electric Works, 527-531 W. 34th St., New York. Form No. R-3409. Pp. 22; 3½ x 6 in.; illustrated.

Electric Hoists. Sprague Electric Co., 527-531 W. 34th St., New York. Bulletin No. 48923. Pp. 32; 8 x 10½ in.; illustrated.

"Little David" Pneumatic Drills. Ingersoll-Rand Co., 11 Broadway, New York. Form No. 8507. Pp. 40; 6 x 9 in.; illustrated.

Single-Phase Motors, Varying Speed. Sprague Electric Works, 527-531 W. 34th St., New York. Pp. 12; 8 x 10½ in.; illustrated.

Air Lift Pumping System. Sullivan Machinery Co., 122 S. Michigan Ave., Chicago, Ill. Bulletin 71-C. Pp. 36; 6 x 9 in.; illustrated.

Imperial Arc Headlights and Incandescent Headlights. Crouse-Hinds Co., Syracuse, N. Y. Catalogs No. 201 and 202. 6 x 9 in.; illustrated.

Imperial Duplex Dry Vacuum Pumps. Ingersoll-Rand Co., 11 Broadway, New York. Form No. 3038. Pp. 24; 6 x 9 in.; illustrated.

Thew Shovels, Steam, Electric, Gasoline. The Thew Automatic Shovel Co., Lorain, Ohio. Catalog No. 9. Pp. 32; 6 x 9 in.; illustrated.

Straight Line Air Compressors. Sullivan Machinery Co., 122 S. Michigan Ave., Chicago, Ill. Bulletin 75-B. Pp. 16; 6 x 9 in.; illustrated.

Draeger Self-Rescuer. The Draeger Oxygen Apparatus Co., 422 First Ave., Pittsburgh, Penn. Bulletin. Pp. 8; 6 x 9 in.; illustrated.

Duplex Steam Pumps. Dean Bros. Steam Pump Works, Indianapolis, Ind. Circular No. 104. This gives details and construction of pump.

Personal

D. Evandall has been recently appointed general manager of operations of the Rich Block Coal Co., operating at Morrisvale, W. Va.

"Imperial X" Duplex Steam-Driven Compressors. Ingersoll-Rand Co., 11 Broadway, New York. Form No. 3311. Pp. 20; 6 x 9 in.; illustrated.

Coal Mining, Plants, Coal-Washing Plants, Etc. Roberts & Schaefer Co., Chicago, Ill. Bulletin No. 32. Pp. 20; 9½ x 12 in.; illustrated.

Type B Pulmotor—Hand Operated. The Draeger Oxygen Apparatus Co., 422 First Ave., Pittsburgh, Penn. Bulletin. Pp. 8; 6 x 9 in.; illustrated.

Ingersoll-Rogler Straight-Line Dry Vacuum Pumps. Ingersoll-Rand Co., 11 Broadway, New York. Form No. 3037. Pp. 24; 6 x 9 in.; illustrated.

"Ceag" Electric Cap Lamp. The Concordia Safety Lamp Co., Inc., Fulton Building, Pittsburgh, Penn. Bulletin No. 101. Pp. 20; 6 x 10 in.; illustrated.

"Golden Glow" Headlights, Searchlights, Projectors. Electric Service Supplies Co., 17th and Cambria Sts., Philadelphia, Penn. Catalog; pp. 48; 6 x 9 in.; illustrated.

Some Modern Coal Tipples. Link-Belt Co., 39th St. and Stewart Ave., Chicago, Ill. Book No. 303. Pp. 16; 6 x 9 in.; illustrated. This is a reprint of an article by H. J. Edsall, M. E., which appeared in "Coal Age."

Stroh Steel-Hardening Process. Stroh Steel-Hardening Process Co., Pittsburgh, Penn. Catalog. Pp. 24; 9 x 12 in.; illustrated. This contains description of process and shows various castings made of Stroh steel, including mine-car wheels.

Blue Diamond Coal Co.'s Tipple. Link-Belt Co., 39th St. and Stewart Ave., Chicago, Ill. Booklet No. 308. Pp. 12; 6 x 9 in.; illustrated. This is a reprint of an article by Harry Reisser, which appeared in the April 7 issue of "Coal Age."

Uses of "National" Pipe. National Tube Co., Pittsburgh, Penn. Bulletin No. 27. Pp. 52; 8½ x 11 in.; illustrated. This bulletin shows the wide range of application of this pipe and contains various tables which ought to be of value to those interested.

Industrial News

Lexington, Ky.—The Elkhorn Coal Co. has increased its capital from \$30,000 to \$100,000 for extensions.

Nelsonville, Ohio.—The capital stock of the Big Bailey Coal Co. has been increased from \$10,000 to \$25,000.

Cleveland, Ohio.—The Cleveland & Morgantown Coal Co. has increased its capital stock from \$300,000 to \$500,000.

Cadiz, Ky.—The Williams Coal Co. is planning for the immediate installation of new machinery and equipment. John S. Crenshaw is president.

Greensburg, Penn.—The Larimer Gas Coal Co., has been incorporated with a capital of \$60,000 to operate local properties. Samuel Miller is head of the company.

Birmingham, Ala.—The McGonigal Coal Co. has been incorporated in Birmingham by T. C. and Dan McGonigal and Jas. H. Autrey, with a capital stock of \$10,000.

Princeton, Ky.—The Haffaw Mining Co., F. C. Eaton, president, and J. W. Hamilton, secretary, have announced the dissolution of that company.

Graham, Va.—The Garland Pocahontas Coal Co. is planning for the installation of new machinery and equipment, including pumping equipment, drills and mine fans. R. E. Baldwin is secretary.

Seranton, Penn.—The Bennett Coal Co. has been incorporated with a capital of \$150,000 to operate local mining properties. Edward A. Judge is the principal incorporator.

West Frankfort, Ill.—The West Frankfort Coal Co. has awarded a contract to the Roberts & Schaefer Co. of Chicago, for a standard steel head frame, for its mine here.

Indiana, Penn.—Elmer Ellis and George Hetrick of Indiana are at the head of a company which has begun developments on a large tract of coal near Black Lick, Indiana County.

Springville, Ala.—The Springville Coal Co. has filed articles of incorporation with capital stock of \$2000. The offices of the company will be at Springville, St. Clair County.

Canal Fulton, Ohio.—Papers filed with the secretary of state ask for an increase in the authorized capital stock from \$150,000 to \$400,000 for the Fulton Pit Car and Manufacturing Co.

Ramey, Penn.—The Bulah Shaft Coal Co. has awarded a contract to the Roberts & Schaefer Co. of Chicago, for a standard

Marcus patent coal tipple for installation at the mine here.

Wilkes-Barre, Penn.—The Lehigh Valley Coal Co. has commenced the use of box cars for coal shipments from its properties in the Lehigh Valley district, owing to the shortage in gondola cars.

Sesser, Ill.—The Modern Coal Co. of Chicago has awarded a contract for the building of a complete coal mining plant, including tracks and structures, to the Roberts & Schaefer Co.

Cleveland, Ohio.—The P. O. McIntire Coal Co. has been incorporated for \$10,000 to mine and sell coal. The incorporators are: W. R. Winn, L. A. Kujawski, Z. F. Harris, C. J. Buckley and R. S. Force.

Shawnee, Ohio.—The Azbell Coal Co. has been incorporated for \$10,000 to mine and sell coal. The incorporators are: Charles Crooks, Joe Sanborn, John Nutter, Charles Rutherford and Henry Asbell.

Toledo, Ohio.—The Blackbird Mining Co. has been incorporated for \$1000 to mine and sell coal. The incorporators are Leon Z. Netzorg, Anna B. Netzorg, E. M. Wehrle, I. Stark and L. C. Filbright.

Orenda, Penn.—The United Coal Corporation of Pittsburgh, has awarded a contract to the Roberts & Schaefer Co. of Chicago, for a Marcus patent coal tipple for installation at this point.

Nelsonville, Ohio.—The Chauncey Coal Co. has been incorporated for \$25,000 to mine and sell coal. Incorporators are: M. P. Ohlinger, Walter Wolf, John Reuter, Gus Malone and Edward Humphrey.

Youngstown, Ohio.—The Culbertson Coal Co. has been incorporated for \$25,000 to mine and sell coal. Incorporators are: R. L. Culbertson, W. A. Coy, C. S. Hatton, J. W. Morgan and M. C. Mohoney.

Olcott, W. Va.—The Sequoi Coal Co. will develop about 900 acres in the Black Band coal bed near Olcott. The output of the company will be sold through the Indian Run Coal Co., at Charleston, W. Va.

Kingwood, W. Va.—The Spencer-Sniffen Coal Co., with headquarters at Nelsonville, Ohio, has been granted authority to operate in West Virginia and will develop about 1000 acres of coal land near this place.

Princeton, W. Va.—The Hines Colliery Co. is planning for the installation of mining machinery to develop about 1600 acres of property. It is planned to install a plant with capacity of 1000 tons of coal daily.

Crooksville, Ohio.—The Crooksville Mining Co. has been incorporated with a capital of \$10,000 to mine and sell coal. Incorporators are: J. J. Hull, A. E. Hull, L. A. Springer, Floyd Hull and C. E. Foreman.

Cleveland, Ohio.—The Pittsburg & Ashland Coal and Dock Co. has been incorporated for \$600,000 to mine and ship coal. Incorporators are: J. C. Heinlein, W. G. Lewis, J. V. Maher, W. G. McDole and W. A. Victory.

Marmet, W. Va.—The Central Steel Co., which purchased about 5000 acres of coal land near Marmet recently, will begin development of the property soon. The headquarters of the new company are located at Massillon, Ohio.

Blackjoe, Ky.—The Clover Gap Coal Co. is planning for the purchase of new machinery for operation of its local properties. This will include shaker screens, tipple scales, mine cars and other equipment. L. A. Bowling is president.

Morgantown, W. Va.—The Chaplin Collieries Co. has been incorporated with a capital of \$100,000 to operate mines in the Case and Grand districts. J. L. Keener, S. M. Chaplin and O. C. Brown, all of Morgantown, are the incorporators.

Mossy Bottom, Ky.—The Kentucky Block Fuel Co. was organized here recently by James Bailey, W. A. Bishop and H. James Wagoner with \$100,000 capital stock. A coal development will be made at Mossy Bottom in the Pike County field.

Avondale, W. Va.—The Garland Pocahontas Coal Co. has been incorporated with a capital of \$50,000, to operate properties in McDowell County. J. W. and J. K. Baldwin, North Fork; and W. A. and M. E. Thornhill, Bluefield, are the incorporators.

Harlan, Ky.—The Gatun Coal Co. recently organized here is starting the work of development on an extensive coal land tract on the Seagraves Branch of the Louisville & Nashville R.R. The company has increased its capital stock from \$10,000 to \$50,000.

Wellston, Ohio.—The War Department recently made a requisition on the Jackson County Coal Association for nine cars of coal weekly for Camp Sherman, at Chillicothe, Ohio, until Sept. 1, when the order will be increased. The price was fixed at \$3 a ton.

Francisco, Ind.—The Fluhart-McCloud Collieries Co. is the name of a \$200,000 corporation organized by Ohio men to operate a mine in the Indiana field. The moving spirits are Harry Fluhart and Stanley M. Krohn, of Dayton, and W. S. McCloud, of Wellston.

Charlestown, W. Va.—The International Mill and Timber Co., of Bay City, Mich., will shortly open a branch office in Charlestown and prepare to furnish "Readi-Cut" houses for mine operations. This firm will probably be represented in Charlestown by R. O. Woodruff.

St. Louis, Mo.—The Blackfoot Coal and Mercantile Co. of Columbia, Mo., has been incorporated, with a capital of \$17,000 by M. E. Fawks, W. R. Prather and S. C. Hunt to develop and operate coal mines, deal in coal-bearing lands and handle coal at wholesale and retail.

Clute, W. Va.—The Bear Coal Co., recently organized with a capital of \$50,000, is planning for the installation of a coal mining plant, including hoisting engine, mine cars, etc., on its properties. The company plans for a daily capacity of about 200 tons. F. M. Cook is president.

Kittanning, Penn.—The Pittsburgh & Allegheny Coal Co., Kittanning, and the Pittsburgh & Clarion Coal Co., East Brady, have been incorporated with capitals of \$50,000 and \$25,000, respectively, to operate local properties. M. M. Bart, New York, is the principal incorporator.

Johnstown, Penn.—The Watkins Coal Co., 17 Battery Place, New York, has acquired the property of the Hastings Coal and Coke Co., at Kinport, Penn., consisting of mines, coke plant and other structures. The new owners are planning to enlarge and improve the plant, increasing the present capacity.

Highpoint, Mo.—W. A. Garrett, Richard Daily, John Holdner and Perry Nance, all of Bowen, Mo., Joseph Reynolds of Leeton and Archibald Kavanaugh of Kansas City have organized a coal company and a shaft is being sunk at Highpoint, where there is a 5-ft. bed of coal only 50 ft. below the surface.

San Francisco, Calif.—The Sullivan Machinery Co. recently announced that its San Francisco office had been moved from the Sheldon Building, No. 461 Market St. to the Hobart Building, No. 582 Market St. Ray P. McGrath is manager at San Francisco.

Hopkinsville, Ky.—The Williams Coal Co. has been incorporated with a capital of \$25,000 and will open a mine near Manington, Ky. J. S. Crenshaw, of Cadiz, Ky., is president; Dr. S. H. Williams, of Crofton, vice president, and L. D. Brown, of Amherstdale, W. Va., secretary and treasurer.

Charleston, W. Va.—The Davidson-Connellsville Coal and Coke Co. has been incorporated with a capital of \$100,000 to operate mines in Monongalia County. Headquarters will be at Morgantown. Charles, William George Davidson and William C. Reynolds, all of Connellsville, Penn., are the incorporators.

Springfield, Ill.—A report of the Chicago & Alton R.R. for the Springfield division shows that the road is shipping from 6000 to 8000 tons of coal from Springfield and vicinity daily, a greater quantity than has ever been shipped at this season and more than is shipped during some of the winter months in normal times.

Kansas City, Mo.—The Dean Coal Mining Co. has opened offices in the Dwight Building here. This is a newly formed company being now owned by Frank J. Dean, formerly owner of the Baltimore Hotel. The company is using the steam shovel or stripping process in mining, and its holdings are in the vicinity of Mulberry, Kansas.

Charleston, W. Va.—Mine mules and Shetland ponies are now in good demand, this being the result of the difficulty in securing steel rails and electric wire for installation in new mines. Some operators are buying mules and ponies for the first time in many years because of the difficulties in securing electrical equipment for mine roads.

Cincinnati, Ohio.—In the United States District Court an order has been made, with the consent of Edward Schonebaum, receiver of the Marmet Coal Co. for the sale of the steamer "Florence Marmet," which has been the object of a libel filed by the Kanawha Dock Co. and others. The vessel will be sold to the highest bidder on Aug. 30.

Huntington, W. Va.—The Hickory Ash Coal Co., owned in Wellston, Ohio, was recently sold to W. E. Deegans and others, of Huntington. The new company is operating under the name of the Sterling Coal Co., with S. C. Scholl as general superintendent. The output of the mine will be

handled by the W. E. Deegans Coal Co., of Huntington.

Martin's Ferry, Ohio.—Prof. M. B. Hammond, of the Ohio State University, is touring the eastern Ohio coal field, investigating conditions about the mines in the interest of the Ohio Council of National Defense. The shortage of cars and the low production, as well as why miners are leaving to take work in mills, are being investigated by Professor Hammond.

Stigler, Okla.—The Haskell Coal Mining Co. has been organized and charter has been filed in the office of Secretary of State Lyon at Oklahoma City. The company has a capital stock of \$20,000 and the incorporators are: Albro Martin of Stigler, Okla., and O. W. Miller and Earle F. Murphy of Fort Smith, Ark.

Middlesboro, Ky.—W. E. Price, J. W. Greaver, J. J. Cozatt and A. C. Carr, of Middlesboro, have purchased the coal properties of the Long Ridge Coal Co., on the Bell-Harlan county line on the Cumberland River. They have taken possession and expect to make extensive improvements and additions to the equipment.

Hellier, Ky.—The Kentucky Solvay Co. at Greenough near here will build 100 additional miners' houses and make other improvements in the plant necessitating an outlay of several hundred thousand dollars. It is expected to double the present output of 20 cars daily within the next few months. Additional coal lands were recently acquired.

Pikeville, Ky.—The Black Beaver Coal Co. is the latest to be organized here by Benjamin F. Auxier, H. J. Stallard and Stoney Amick to develop coal lands along the Baltimore & Ohio's Long Fork Branch on Beaver Creek, the initial work to be started at once. It is planned to make a development of 600 tons, and to begin shipping coal within 90 days.

Prestonsburg, Ky.—The Middle Creek Coal Co. organized recently by W. S. Wells, Geo. B. Archer, J. K. Wells and others is starting the work of development both in the Middle Creek and Beaver fields. George B. Archer will be manager of the new plant at the latter place which is on the Beaver Branch of the Baltimore & Ohio. The company has a capital stock of \$150,000.

Cleveland, Ohio.—The Pickands-Mather Co., of this city, has sold to the Clarkson Coal and Dock Co., of St. Paul, Minn., 7500 acres of coal land in Belmont County, Ohio, at a price said to have been around \$5,000,000. The purchaser expects to conduct operations with an annual capacity of 1,500,000 tons for the current year, with considerable increases in the future.

Huntingdon, Penn.—Engineers are now at work surveying for an extension of the Huntingdon & Broad Top R.R. through Sandy Run, Bedford County, toward Wells Tannery, Fulton County, where it is proposed to tap a new coal field recently developed. There are three beds of good bituminous coal on the tract. The proposed extension is more than five miles long.

Youngstown, Ohio.—The Republic Iron and Steel Co. has indicated that it is in the market for 50 gondola cars for coal and for 50 coke cars. The Youngstown Sheet and Tube Co. recently ordered a similar number of cars. These and other steel companies in this section are preparing to meet their fuel requirements by providing cars in case of a shortage of railroad rolling stock.

Washington, Penn.—The already heavy and constantly increasing demand for coal for manufacturing purposes is causing a fair-sized boom in the building of miner's houses, or houses for miners here. The Diamond Coal and Coke Co. is now receiving bids for 30 double dwellings for miners at Parnassus, while 50 miners' houses are to be built near here, for the Lincoln Coal and Coke Co.

Columbus, Ohio.—Papers have been filed with the secretary of state increasing the authorized capital of the Superior Coal and Dock Co., of Columbus, which operates a large dock at Superior, Wis., from \$300,000 to \$500,000. At the same time the authorized capital of the Maynard Coal Co., of Columbus has been increased from \$350,000 to \$500,000. Both concerns are under the same management.

Clarksburg, W. Va.—Another coal deal involving valuable coal land in Taylor County was recently disclosed by the filing of a deed in the office of the county clerk at Grafton. All the mining plants, coal tracts and other property formerly belonging to the McGraw Coal Co., as well as to James A. Clark and wife, of Cumberland, are conveyed to the Simpson Creek Coal Co., of Simpson, the consideration being \$700,000.

Clarksburg, W. Va.—Coal lands continue to increase in price in this section with con-

siderable activity in trading. In several instances prices as high as \$2000 and even \$3000 per acre are obtained for small tracts carrying good coal beds. These prices are exclusive of surface, oil and gas rights. George W. Moffatt, of Shinnston, recently closed a deal for the sale of 2 acres near that city for \$6000, while another small tract nearby has been sold at \$2000 per acre.

Rosebud, W. Va.—According to a report, the Rosebud Fuel Co. has disposed of its holdings at Rosebud on the Short Line R.R. to the J. M. MacDonald Coal Mining Co. The consideration is said to be \$100,000, and a deed has been filed in the county clerk's office. The deed conveys all miners' houses, blacksmith shops, tipples, tippie equipment, railroad switches, sidings, and all other mining equipment at Rosebud Mines Nos. 1 and 2 to the purchasing company.

Columbus, Ohio.—Reports of sales of coal cars by railroads operating in Ohio are being investigated by the Ohio authorities, with a view to taking some action if the reports are found to be true. It has been rumored that many cars have been disposed of to Canadian railroads, in spite of the needs of Ohio mines, and State authorities declare that if this is the case some action will be taken to prevent the delivery of such cars. According to railroad men, however, the only sales made have been of equipment no longer fit for use.

Birmingham, Ala.—Numerous companies have recently been incorporated for the operation of small mines in the Walker County field, whose production in the aggregate will add considerably to the production of that field. Incorporation papers have been granted to the following companies, \$2000 being the authorized capital in each case: Fournier Coal Co., Carbon Hill; Blue Ridge Coal Co., America; Adair Coal Co., Dora; Porter Coal Co., Jasper; Crown Coal Co., Carbon Hill; Lynn Coal Mining Co., Lynn; Sherron Coal Co., Dora.

Birmingham, Ala.—A petition has been filed with the Alabama Public Service Commission by eleven railroads engaged in intrastate business praying for an increase in coal and coke rates from 5c. to 15c. per ton, effective Aug. 15 or as soon thereafter as practicable. Carriers claim that these adjustments are sought in order to make intrastate rates conform to those fixed for interstate business, which had the approval of the Interstate Commerce Commission and were effective July 1. The hearing of the above case is set for Sept. 5 before the commission at Montgomery, and the proposed increases will doubtless encounter strong opposition from operators.

Philadelphia, Penn.—Representatives of some of the big retail and wholesale coal dealers on Aug. 5 made a tour of the anthracite field appealing to operators to rush their shipments so as to avert a threatened fuel famine the coming winter. They were told that every effort is being made to fill orders and that the collieries are being worked to their utmost capacity to meet the demands of the trade. It is said that in many cases dealers failed to take advantage of the spring price cut and to fill their bins at a time when there was a more plentiful supply than is available now or in prospect.

Columbus, Ohio.—According to the annual report of L. D. Devore, Ohio's chief mine inspector, production of coal in Ohio for the fiscal year ended June 30 was the greatest on record, except in 1913, 34,536,552 tons being mined, as against 36,285,466 in 1913, and only a lack of cars prevented business from exceeding the 1913 record. Of the amount produced, 2,414,367 tons were mined by hand, the remainder, 31,599,032 tons being mined by machinery. Belmont county led the state, with a production of 10,553,988 tons, other leading counties producing the following amounts: Jefferson, 5,366,393; Guernsey, 4,397,262; Athens, 3,683,566; Perry, 1,195,127; Hocking, 1,435,188.

Philadelphia, Penn.—H. W. Perrin, sales agent for the Susquehanna Coal Co., has been put in charge of the anthracite sales department of M. A. Hanna & Co., of Cleveland. The Hanna interests recently purchased all the anthracite holdings of the Pennsylvania R.R., among which the Susquehanna was the leading property. Mr. Perrin has been connected with the Susquehanna for many years. It was reported that while the Hanna company would probably maintain the regular volume of shipments to Eastern markets, it was certain that increased shipments from the Susquehanna collieries would be made to Western points. This increased volume of Western consumption, it was said, would be attained by increasing the output of the collieries.

Ottawa, Ont.—The Ontario Railway and Municipal Board has refused the application of the City of Ottawa to establish a municipal fuel depot, on the ground that the committee sent by the city to investigate the coal situation had reported against the proposal and that the report had been approved by the city council.

Sydney, N. S.—The inquest into the New Waterford colliery explosion was concluded recently and the coroner's jury returned a verdict severely censuring the company's officials. It found that the explosion was caused by ignition by some means the exact nature of which was uncertain and that the gross irregularity of mining has been largely responsible for the retention of the gas and that the officials had been guilty of gross neglect.

Columbus, Ohio.—Because of the possibility that they might gain information of military value, aliens in camp cars cannot approach within 500 ft. of coal repositories and sidings filled with loaded coal cars, the Ohio Fire Marshal has ruled. The order is also applicable to places where munitions are stored. One reason for this new order is given by the fire marshal, who states that a cut of camp cars in which 200 Austrian workers lived at night was left on a spur connecting with an interlocking tower of two trunk lines. The spur was also near a culvert and sidings filled with coal cars and cars bearing munitions. A few days later these laborers drifted out or employment in pairs. The fire marshal is asking where they went and what kind of information they bore with them.

St. Louis, Mo.—The Traffic Bureau of the St. Louis Chamber of Commerce has been notified by Commissioner Daniels of the Interstate Commerce Commission that the Commission cannot take any action on the Bureau's complaint against the existing 35-cent differential in the coal freight rate between St. Louis and East St. Louis until the Illinois Public Utilities Commission renders its decision. The 15 cent freight increase which raised the differential from 20 cents to 35 cents has been suspended in Illinois and hearings are being held by the Utilities Commission in the different coal fields of the state. A decision is expected in October. The Traffic Bureau of the Chamber of Commerce finds that it can do nothing further until the decision is given. The suspension applies only to intrastate shipments. On all interstate shipments the 15 cent increase authorized by the Interstate Commerce Commission has gone into effect.

St. Louis, Mo.—Attorney General McAlister, who has been supervising the hearings in Kansas City and Jefferson City, Mo., in connection with coal prices, is not through. He will conduct further investigations at St. Louis, and claims that he will show that the coal operators' associations are discriminating in prices between customers and between territories. He claims to have enough evidence to oust a number of companies from doing business in the state. The local coal trade contends that there is nothing wrong with the prices made by St. Louis shippers, with few exceptions. It is known that certain St. Louis shippers complain about the low prices quoted by their competitors in outside markets, but the outside markets were not in the State of Missouri. Locally there is no grievance against the prices of Mt. Olive and Standard coals. The principal agitation is against the price asked on Williamson and Franklin County.

Nashville, Tenn.—Preparations are being made by the Tennessee Manufacturers' Association, and the University of Tennessee, in cooperation with the Federal Bureau of Mines, for an educational tour of the manufacturing centers of the state. The design is to educate manufacturing consumers of coal in methods of using that fuel so as to hold consumption down to a minimum and at the same time utilize the maximum of power. In the party will be Dean Charles E. Ferris, of the engineering department of the university; O. P. Hood, chief mechanical engineer of the U. S. Bureau of Mines; J. E. Edgerton, president, and C. G. Gilbert, secretary of the Tennessee Manufacturers' Association. It is proposed to begin in the eastern part of the state and to continue the work until Memphis is reached. Inspections will be made by the engineers of the principal power plants in all of the communities visited with special instruction to the engineers in charge, while in each of these communities there will also be given lectures dealing with the subject of efficient consumption of fuel. Stereopticon slides will be used to illustrate the lectures. Manufacturers of Tennessee use three-quarters of a million tons of coal annually, it is estimated, and a reduction of consumption would be of obvious advantage.

Market Department

GENERAL REVIEW

Anthracite shipments continue at record-breaking proportions. Renewed buying of bituminous. Poor transportation facilities restricting Lake shipments. Middle Western situation mixed.

Anthracite—While the hard coal shipments for last month show a decline from the new high record of the preceding month, they still continue very heavy, and the total for the year shows a very substantial increase over the same period last year. Dealers' yards, which are usually stocked by this time, are practically bare of coal, but with the extra tonnages which they have been delivering to their customers this summer all in hand, it is likely the yards would be overflowing with coal. Embargoes of various kinds, and some incipient congestions are interfering with deliveries, particularly to this point. Shipping interests continue to show confidence in their ability to handle the situation on all sizes, with the possible exception of pea coal on which there is very little heard. Interest at the moment is centered largely on what action will now be taken by the Government, and there is a tendency to mark time, pending further developments in this direction. Shipments up the Lake are heavy.

Bituminous—In spite of the uncertainties occasioned by the persistent rumors of further reductions by the Government, there are signs of renewed activity among the large buyers. This is probably due largely to the growing feeling that transportation facilities will soon be still further restricted by the heavy troop movement and the handling of war supplies, the Government inquiry for 40,000 tons of coal for use at the cantonment in Massachusetts being an example of the latter. Buyers are showing a disposition to be on the safe side and get the coal while it is to be had. That the railroads view the situation with some apprehension is evident from the heavy reserve stocks they are storing on the ground in various sections. Government prices continue to rule in the spot market but with still practically no coal being offered. It is clear that the more careful of the consuming interests are following the market closely, not so much for their current requirements as for supplies several months from now.

Lake Trade—The poor car supply has greatly interfered with the movement up the Lakes, but the railroads are now going to concentrate their efforts on Lake coal, and a substantial improvement is expected from now on. Domestic demand is becoming sufficiently active to absorb considerable coal, and this will increase steadily as the season advances, in spite of the tendency to hold off in anticipation of further reduction by the Government. Steam demand is heavy, industrial consumers showing a disposition to take no chances because of the heavy orders and unprecedented prices they have on hand. The possibilities of the army draft and its effect on the coal industry are looming up more ominously as the time approaches for this to go into effect.

Middle West—Two opposing influences are accentuating the uncertainties in the Middle Western market. Newspaper agitation for lower prices is tending to restrict buying on the ground that quotations are going to be forced to still lower levels while a spreading out of the labor difficulties is attaining to proportions that is now becoming a matter of much concern. Car supply also continues a dominant factor, especially at those mines loading other than railroad coal; conditions at these latter operations are being further aggravated by men leaving for mines working on railroad business where the car supply is better. The domestic trade is suffering the worst from the expectation of lower prices, industrial and manufacturing concerns buying freely and showing no disposition to take chances as to the future.

A Year Ago—Anthracite wholesale trade active. Strong demand for bituminous. Exports heavy. Lake movement handicapped by scarcity of vessels. Middle Western steam consumers accumulating reserve stock.

Comparative Average Coal Prices

The following table gives the range of mine prices in car lots per gross ton (except where otherwise noted) on 12 representative bituminous coals over the past several weeks and the average price of the whole group for each week for the past four months:

	Year Ago	Aug. 18	Aug. 11	Gross Averages ^a	1917	1916
† Boston						
Clearfields.....	\$1.15@1.75	\$3.64@4.50	\$4.15@4.50	Apr. 21	3.83@4.14	1.46@1.62
Cambrias and Somersets.....	1.45@1.90	3.64@4.75	4.40@4.75	Apr. 28	3.81@4.12	1.45@1.62
Pocah. and New River ¹	3.00@3.25	5.14@6.50	5.14@6.50	May 5	4.04@4.40	1.45@1.59
Philadelphia				May 12	4.64@4.98	1.44@1.59
Georges Creek (Big Vein)....	1.90@2.00	3.25@3.75	3.25@3.75	May 19	5.08@5.54	1.42@1.56
W. Va. Freeport.....	1.30@1.40	3.25@3.75	3.25@3.75	May 26	5.10@5.58	1.41@1.55
Fairmont Gas mine-run.....	1.45@1.55	3.25@3.75	3.25@3.75	June 2	5.00@5.46	1.47@1.63
Pittsburgh (steam coal)²				June 9	4.80@5.24	1.52@1.72
Mine-run.....	1.35@1.45	3.00@3.25	3.00@3.25	June 16	4.77@5.23	1.50@1.66
3-in.....	1.45@1.55	3.50@3.75	3.50@3.75	June 23	4.81@5.15	1.51@1.67
Slack.....	.95@1.00	3.00@3.25	3.00@3.25	June 30	4.79@5.15	1.46@1.64
Chicago (Williamson and Franklin Co.)³				July 7	3.88@4.35	1.41@1.57
Lump.....	1.65@1.75	3.45@3.55	3.45@3.55	July 14	3.95@4.12	1.41@1.57
Mine-run.....	1.20@1.30	2.70@2.80	2.70@2.80	July 21	3.96@4.13	1.41@1.57
Screenings.....	.95@1.00	2.70@2.80	2.70@2.80	July 28	3.39@3.88	1.43@1.58
Gross average⁴.....	\$1.48@1.66	\$3.38@3.87	\$3.48@3.97	Aug. 4	3.48@3.84	1.45@1.60
				Aug. 11	3.48@3.97	1.48@1.66
				Aug. 18	3.38@3.87	1.48@1.66

¹ F. o. b. Norfolk and Newport News. ² Per net ton. ³ The highest average price made last year was \$4.80@5.33 made on Nov. 25. ⁴ Price lower than the week before. †Price higher than previous week.

COAL PRODUCTION

A further decrease from 75.8 to 74.6 in the percentage of full-time capacity realized in actual output is reported for the week ended July 28, compared with the week ended July 21. While production held its own in Ohio and increased slightly in eastern Kentucky and Tennessee, it declined in Illinois, Indiana, western Pennsylvania and southern Virginia.

State	Per Cent. of Full-Time Output Produced in Week Ended:					
	June 30	July 7	July 14	July 21	July 28	
Illinois.....	72.7	79.6	79.5	a77.1	76.0	
Indiana.....	69.5	73.0	73.0	69.3	67.8	
Ohio.....	65.5	75.3	69.3	69.2	69.4	
Western Pa.....	72.3	75.4	78.6	77.9	76.3	
Southwestern Va.....	76.9	85.6	89.6	88.2		
East Kentucky & Tenn.....	72.8	75.0	78.4	81.0	82.6	
Alabama.....	74.5	85.6	78.0	78.2	69.5	
Kan. & Mo.....	66.1	61.6	75.7	69.2	79.0	
Okla. & Ark.....						

Total reported.. 72.0 77.4 77.5 a75.8 b74.6

a Changed from figure reported in preceding bulletin by inclusion of late reports.

b Does not include Alabama.

CARLOADS OF COAL ORIGINATING ON PRINCIPAL COAL-CARRYING ROADS

	Week Ended		
	July 21	July 28	Aug. 4
Ala., E. Ky., and E. Tenn.....	a8,794	9,415	7,581
Ill., Ind. and West. Ky.....	17,923	16,766	14,404
Pa. and Ohio.....	44,372	44,180	41,338
W. Va. and Va.....	10,709	10,733	10,212
Smokeless.....	16,652	17,860	16,648
High volatile.....			
West of the Mississippi.....	1,704	a1,813	1,794
Total.....	a100,154	a100,767	91,977

a Revised from last report.

Car shortage remains the principal factor limiting production throughout the Northern states. A better car supply is reported from Virginia and the South. Figures for Alabama, available for the first time, indicate that the mines are running with less interruption than in any other state reporting to the Geological Survey.

The operation of mines which reported causes of lost time, representing between one-fourth and one-fifth of the production of the country, is shown for the three weeks from July 9 to July 28, in the following tables:

District and Week	Capacity	Output	Losses	% of Full Output Produced	Lost
July 14.	3,049,299	2,332,908	716,391	76.5	23.5
July 21.	3,140,023	2,337,505	802,518	74.4	25.6
July 28a	3,216,218	2,347,262	868,956	73.0	27.0

a Does not include Alabama.

BUSINESS OPINIONS

Iron Age—Without taking a final position on the question of selling to the Allies at the same prices as to the Government, steel manufacturers have accepted orders from officials at Washington this week applying on 10,000 tons of annealed wire and 20,000 tons of wire rods for Italy, prices to be fixed after the Trade Commission's findings are made up. When these Italian inquiries first appeared some weeks ago \$4.50 was quoted on the wire and \$85 on the rods. While the general question is in abeyance, it is understood that some steel interests have expressed a willingness to take business from the Government at prices to be determined later, even though the material is for an ally.

Dun—The repressing effect of existing uncertainties has become more sharply defined, and in some of its most important branches business is characterized by rather more than the usual midsummer halting. With the continued doubts about prices, and with the widening scope of the export embargo, the lull natural at a period of the year is intensified, and conservatism is a more conspicuous feature.

Bradstreet—Favorable news pertaining to crops, industries and trade outweighs that of a contrary aspect, though buying by the government is assuming more importance and relegating ordinary demand to the background. Unsettling factors comprehend the as yet unknown effects of governmental price fixing, labor unrest, concern over further drains to be made by the draft and conservatism in making purchases for future delivery, this attitude being largely dictated by high prices, which, some argue, have reached zenith point. But through the streaks of conservatism it can be seen that business, especially in sections where crops, translated in terms of money, mean most, is emerging from the summer lull, and in consequence orders for fall and winter tend to broaden out.

Dry Goods Economist—In general conditions, several important developments have occurred within the last week or so. Prominent among these is the Department of Agriculture crop report, which shows a vast improvement in the prospect for corn, indicating a three-billion-bushel yield, together with promise of record crops of practically all other farm products, with the exception of wheat. And even the wheat crop promises to be thirteen million bushels greater than that of last year.

Marshall Field & Co.—Current wholesale shipments of dry goods are running ahead of deliveries for the corresponding week last year. Road sales for immediate and future deliveries are well ahead of those for the same period a year ago. Customers have not attended market in quite as large numbers as in the preceding year. Collections continue to be favorable.

Atlantic Seaboard

BOSTON

Spot sales of Pocahontas and New River infrequent except for bunker use. Only scattering inquiry inland. Pennsylvania grades continue fairly active. Anthracite shows no improvement.

Bituminous—On Hampton Roads coals there is very little doing in this market. Shipments on contract are coming forward with accustomed regularity but receipts other than on contract are very light. There are signs of renewed inquiry, however, due partly to a realization among some of the large buyers that the railroad will not be in position to handle coal to the extent that some have expected. The railroads themselves, for fuel supply, are spreading coal over spare ground and piling it high where necessary. One of the interesting things is the extent to which the railroads are taking boat coal, even from New York. Among manufacturers generally there is more disposition to take on coal than was observed a fortnight ago.

Most reports of spot coal at Hampton Roads agree that \$5.14 is the prevailing figure for such few cargoes as find their way to New England. In other words, the agencies are adhering closely to their arrangement with Secretary Lane, so far as coal for domestic consumption is concerned. For bunker use and for export there is more latitude and the range of \$6.50@7 is still quoted. Government requisitions are still so frequent that the larger shippers together with their contract business have practically no surplus for sale. For what extra tonnage is produced the line and western trades have the preference, both prepared coal and slack selling in that market at higher prices than prevail at Tidewater.

For spot cargoes here or for coal on cars at the distributing points there is only a light inquiry. With water freights on their present basis, smokeless coals are too high for any but those whose boiler conditions are most exacting. The rest are content to get along with what can be had all-rail; \$9 is the price most commonly quoted for inland delivery, whether at Boston, Providence or Portland.

The important fact, however, is that buyers are keeping in close touch with every phase. It is plain that a large tonnage is still needed for New England. The number of plants in the market for immediate shipment is relatively small, as stocks are ample for the next two months, but the supply for December and January is far short of being adequate. It is the anxiety for winter that is causing many consumers to look about for shippers who will string out deliveries for the next two or three months. Such buyers, however, feel easy enough over current supply to shop around for the more attractive bargains.

Those who have contracts on the Southern coals report that deliveries improved enough during July that the season's quota thus far has been just about filled. Many consumers, however, who have usually placed all their tonnage at Tidewater made heavy purchases all-rail, and that helps explain why receipts from Hampton Roads are less, while contracts are just now being shipped up to the handle.

Southern shippers are apparently making no effort whatever to place their coal here. There seems an inclination to see regular customers through the season and stop there. Certainly it is difficult to get a quotation on Pocahontas or New River f.o.b. loading port.

Output of Pennsylvania grades is reported to be lower than it was the latter part of July. With several of the large mines, particularly those with a well settled population, the August tonnage will be distributed on a percentage basis. The labor supply is getting acute, so many men have either already gone into military service or are subject to call.

Meanwhile, the only coals available to this market on current sales are the fair to medium grades that are not sold up on contracts and for one reason or another are not being exported to any great extent. From \$4.20 up to \$4.75 is being paid for such coals and they are coming forward sufficiently well to encourage purchasers. At that, however, only a restricted tonnage can be had and each quotation is subject to prior sale. All hands are proceeding cautiously.

The recent passage of the Lever food bill has occasioned a lot of comment here. Some of the buyers would like to think that the broad powers conferred upon the President will serve to revise prices downward immediately, but they have some

inkling of the tremendous volume of traffic the railroads are soon to be called upon to handle. Any Government interference will be almost certain to cut down production, at least temporarily. The time for this territory to get its coal is while the going is good, and that this attitude is being adopted is shown by the amount of quiet buying now in progress.

Except occasionally at a Tidewater loading port there is nothing now heard of \$3 coal per net ton at the mines. Most of the water shippers are holding their supplies purely for bunker or export inquiry and they cannot be induced to part with their goods for ordinary water shipments at any price. Apparently there is more shyness over selling coal f.o.b. vessel than f.o.b. mines.

The Ayer, Mass. cantonment is in the market for 40,000 tons of steam coal. It will be interesting to see what the response is.

Bituminous at wholesale, f.o.b. loading ports at points designated, is quoted about as follows:

	Clearfields	Camb. and Somersets
Philadelphia.....	\$4.94@5.85	\$4.94@6.10
New York.....	5.24@6.15	5.24@6.35
F. o. b. mines.....	3.64@4.50	3.64@4.75
Alongside Boston (water coal).....	8.00@8.35	8.25@8.50

Pocahontas and New River are quoted from \$5.14@6.50 f.o.b. Norfolk or Newport News, Va., for spot coal, and \$9@9.25 on cars Boston or Providence for inland delivery.

Anthracite—Egg is the size today in shortest supply. Retailers are bending their efforts to get this size forward, but meet with little success. In fact, the Tidewater dealers in particular are getting so reconciled to the situation that they accept practically anything that can be dumped into boats. A lot of buckwheat is being shipped on orders that called for domestic sizes, and in taking such deliveries the distributors feel that they are making wise provision for the future.

Every port where the tonnage is usually of any material amount, from Eastport, Me., to Bridgeport, Conn., is far in arrears on anthracite receipts for the period beginning Apr. 1, as compared with the similar period in 1916. The trade knows how short coastwise New England was last year, and some opinion can be formed as to the prospect for next winter. Barge deliveries are so far behind that inquiries are beginning to pile in for shipments from other sources, and what will be the state of things when cold weather sets in can only be imagined.

"Independent" coal can still be had in limited quantities. A few cargoes are being shipped but most of the offerings are for delivery all-rail; \$6@6.25 is reported as the range of price on egg, stove and chestnut, but it is very difficult to get orders accepted. All-rail shipments of company coal are light again, and it is probable that not much more will be done in that direction except for consignees who have been regular customers.

NEW YORK

Heavy July shipments of anthracite. Apprehension over what action the Government may take. Spot bituminous scarce except for bunker or export.

Anthracite—This week no material lessening of the demand for the domestic sizes of anthracite is to be found. In Greater New York, egg and stove continue the most active of the three domestic sizes generally traded in, but chestnut is none too plentiful, and there seems to be sufficient demand for this grade to take every ton that comes to the various piers.

In some quarters, the trade are apprehensive that the announcements that are coming out almost daily from Washington regarding the taking over of the coal industry by the Government, may cause a slowing up of the buying movement, as many consumers who are not familiar with the real conditions in the trade may take the view that the Government is going to force the operators to furnish them coal at prices greatly reduced from the present level. However, orders are too plentiful on the books of the wholesale dealers in anthracite at the moment to cause them any worry over the probable slackening down of demand.

Late last week the figures showing shipments of anthracite for the month of July were made public, and while the total for the month was not up to the total of shipments for June by 324,785 tons, yet it showed a very handsome increase over shipments for July of 1916. Moreover, the figures of shipments for the first seven months of this year, showed an increase

of 5,533,802 tons, or 14.2 per cent. over the corresponding period of 1916. This record of shipments shows plainly that the anthracite producers have used every possible means to increase production in the face of the most serious shortage of coal that the country has perhaps ever before witnessed. News from the anthracite regions show that the button strikes are by no means over, and that they are of a regular weekly occurrence. The drafting of many men employed in important positions around the mines is expected to counteract to a considerable extent the efforts that are being made by the operators to increase output.

Pea coal is in better demand, and prices are very firm at former quotations. At New York ports, most of the trading is done in the range of \$5.75 to \$6 per ton.

No. 1 buckwheat is just about easy, with the demand but slightly improved. Rice is not so plentiful as was reported last week, but there are so many qualities offering that the range in quotations is wide. Barley continues plentiful, with some of the inferior grades selling very slowly, and at greatly reduced prices.

Current quotations, per gross ton, f.o.b. Tidewater, at the lower ports are as follows:

	Circular	Individual
Broken.....	\$5.00@5.75	
Egg.....	5.75@5.85	\$6.75@7.00
Stove.....	6.00@6.10	6.90@7.10
Chestnut.....	6.05@6.20	6.95@7.25
Pea.....	4.40@4.95	5.50@6.00
Buck.....	4.10@4.75	4.25@5.00
Rice.....	3.40@3.60	3.25@3.60
Barley.....	3.00@3.25	2.25@3.00

Quotations for domestic coals at the upper ports are generally 5c. higher on account of the difference in freight rates.

Bituminous—The heavy demand noted for spot bituminous last week continues to be one of the strong features of this week's market. It appears that there are many consumers of steam coals who either did not care to contract during the early months of the year or else were unable to place their contracts, who are now in the market trying to secure immediate shipments to protect their plants.

As the demand for spot coal increases, production fails to show any improvement. Some operators report a car supply last week of not more than 50 per cent. Due to this shortage of cars, there is considerable unrest among miners, many of whom go from one section to another in their endeavor to secure steady employment.

As the time for calling the drafted men to the training camps comes nearer, operators are more apprehensive over this situation than heretofore. Most of them fear that the exemption boards are not going to show any particular partiality in exempting miners and that once these men are taken out of the mines there is no possible way to replace them.

There is a great deal of uncertainty and unrest in the trade over the repeated announcements that come from Washington that the coal business will now be regulated by the Government, inasmuch as the Food Bill which became a law last week, gives the President that power. In some quarters it is feared that if the President takes this action, and turns over the coal business to the Federal Trade Commission to run, that it will mean the complete elimination of the middleman.

There is practically no free coal for sale at the New York harbor piers, except for bunker purposes. Coals for bunker or export purposes are offered at the piers at \$6.25 to \$6.50. At the mines middle houses say that it is impossible to buy coal at the \$3 per net ton price, but that there appears to be plenty of coal available at \$4 to \$4.25 per ton gross for use as "bunkers" or for "export" purposes.

Current quotations, per gross ton, f.o.b. Tidewater, for various grades are as follows:

	F. O. B.	Mine Price
Bunker coal.....	\$6.00@6.25	\$4.00@4.50
Commercial coal.....	5.25@5.75	\$3.00 net

PHILADELPHIA

Anthracite retailers expect increased shipments soon. No storage in yards, but good summer deliveries made. Rail restrictions increase. All sizes strong but not. Bituminous unsettled by price regulation rumors. Demand strong, but coal scarce. Car supply around 50 per cent. Good shipments to Canada and Tide. Pool working better.

Anthracite—One of the largest retail buyers in the city, who is particularly close to the shippers, is of the opinion that the big shipments looked for during July and August, will be postponed until

September and October. There is no doubt that the retailer has had a hard summer. He has kept his working force intact, hoping each week to be able to rush the work of completing the orders on hand. While it has been expensive to the dealer, both men and horses have been spared and should be equal to more efficient work later. Even with the bins still empty there are some dealers hopeful enough to add room to their storage space, feeling that in some way they will be able to stock fairly heavy of some sizes, despite the fact that September is almost here. Their plans are probably not founded upon anything more substantial than their hopes, for if they had all the coal they have delivered this summer in excess of the usual household stocking orders they would have considerable piles at this time. If heavy shipments of coal do arrive during the early fall as there is now no reason to believe no serious consequences will have resulted.

Conditions in the retail trade are not as serious as some of the dealers state. If they have furnished some of their customers with more coal than they will need next winter and neglected others, it is not right that the blame should fall entirely on the shippers. The retailers continue to urge the shippers to send more coal, pointing out the many orders they still have unfilled and laying particular stress on those dating back to last April. The shipper is not deceived by this argument, as he knows if the retailer had taken care of every order in the rotation the so-called April orders would have been filled long ago. The dealers bitterly regret the large number of the spring orders they took at the low prices and the only thing they can do now is to fill them at once and take their loss.

Embargoes and car restrictions of various kinds continue to an extent that shippers must constantly be on the alert to avoid errors in their consignments. There has been a "jam" at Port Richmond and the only measure of relief available was to embargo this port to all shippers on all sizes. There is also an accumulation of cars at Park Junction and the B. & O. R.R. has been compelled to embargo this point. It is expected that this will be lifted within the next week or 10 days at the most. The Reading Ry. continues to restrict the use of its cars to its own lines and the Lehigh Valley has not increased the number of cars allowed to go to the Pennsylvania tracks. As a matter of fact the Lehigh Valley road has just issued a very drastic embargo and refuses to permit cars to go off its lines to the New York Central, Central R.R. of N. J., P. & R., Pennsylvania R.R., Grand Trunk and N. Y., N. H. & H. The company states that this embargo will only be lifted when the above roads return some of the accumulation of Lehigh Valley cars which are now on their lines. As it now stands the only chance of local shippers getting coal from the Lehigh Valley will be in such foreign cars as may reach that road. It is not expected, however, that this restriction will hold for any great length of time.

In order to help the car situation the P. & R. will now permit equipment of less than 80,000 lb. capacity to go forward to Port Reading. They are, however, requesting that the larger cars be used whenever possible.

The demand for all the larger sizes is about as reported last week, with little change in the prices. It is understood that at least one middle house is being criticised for disregarding the ruling of the Federal Trade Commission and is charging the following prices f.o.b. cars at quines: Egg, \$5.75; stove, \$6; chestnut, \$6.10, and pea from \$4.50 to \$5. There are no signs of this practice spreading and for the good of the trade in general it is hoped the exceptions will grow fewer.

Broken coal continues in strong demand and any free coal not necessary for contracts still brings from \$6 to \$6.25 f.o.b. mines. Egg does not reach here in sufficient quantities to satisfy the dealers in the outlying sections of the city, although the city trade is not particularly urging for this size. The outside inquiries for egg were particularly strong this week and there seems to be quite a good deal of anxiety to get shipments of this size, especially to the New England territory. Stove is in such general demand that there are practically no stocks on hand and every dealer is crying for it. Chestnut is again the easiest of the family sizes, particularly with the dealers located on the Reading tracks. As a matter of fact some of the dealers are beginning to accumulate comfortable stocks of this size; while a few of them have actually held their orders on it, most of them hesitate to do so fearing it will affect the shipment of other sizes, and the man with an eye to the future says nothing and is piling it up. The demand outside is as strong as ever,

with the call from the West particularly so.

Pea coal is the one size that brings actual fear to the retail trade, principally because most of the April orders still unfilled call for this size. They seem convinced they will receive a good supply of the other sizes sooner or later, but no shipper can be found who will give the big buyers any encouragement as to when their storage bins for this size will be filled. The shippers continue to say they will do the best they can and intimate that chestnut will have to be used to supplement pea coal this winter. Some dealers are trying to encourage their trade to do this, but thus far the matter of price holds most of them off.

The steam sizes are not likely to improve until cool weather, but it can hardly be called a weak market, as the contractors are calling for a fair quantity, much of it being stored wherever space is available. The feeling is growing that when the demand for coal comes the orders will remain unfilled due to the inability of the railroads to move it on account of heavy troop movements, together with war material which is even now beginning to congest all lines. When the heating plants also start up and these storage piles are being drawn upon there will be a sudden active demand again. All steam coal buyers are determined to carry a full stock as long as possible. Buckwheat varies around \$3.40 to \$3.75; rice \$1.90 to \$2.20, and barley \$1.40 to \$1.50. These minimum figures are not being quoted by all shippers. The slight weakness in steam sizes may also be due in part to the much lower figures now prevailing in the bituminous market owing to the Government price agreement.

The dealers located on the Pennsylvania R.R. tracks continue to rejoice in the announced policy of the successors of the Susquehanna Coal Co. They were greatly alarmed at the persistent rumors that this coal would be diverted to the West, but recent events lead them to believe the new company will so increase production that Philadelphia's quota will be as heavy as in former years.

The prices per gross ton f.o.b. cars at mines for line shipment and f.o.b. Port Richmond for Tide are as follows:

	Line	Tide		Line	Tide
Broken.....	\$5.10	\$6.25	Buck.....	\$2.90	3.30
Egg.....	4.35	5.65	Rice.....	2.40	3.40
Stove.....	4.60	5.90	Boiler.....	2.20	3.30
Nut.....	4.70	5.95	Barley.....	1.90	2.15
Pea.....	3.30	4.20			

Bituminous—The trade remains very much unsettled, with all sorts of price regulation rumors afloat. It was believed at the time the \$3 and \$3.50 prices were agreed upon that these were quite fair to all concerned and offered a satisfactory margin of profit to the operators. However, with the passage of the Food Control Act, by Congress with an amendment giving the President the power to regulate coal prices, the newspapers have been filled with all sorts of threats that unless a price lower than \$3 was established the President intended to give the Federal Trade Commission power to regulate prices. It was actually stated that the Commission had already prepared a schedule of prices to be used in this connection. While the reports have not had the official stamp as yet, the effect has been to disturb the business very materially.

Despite all these rumors there continues to be an extra strong demand for coal at the agreed prices, particularly by the large consumers. A number of large consumers are in the market inviting producers to consign coal on open orders to an almost unlimited amount. It may be the smaller user is still inclined to complain about prices, though he is the one who in the end rushes into the market offering a high price for coal when it becomes absolutely necessary to have it.

Yet with all the demand for fuel the deliveries are far from adequate. It is all a question of car supply, as it has been right along. The proportion of the car supply to demand ranges from 45 per cent. to 50 per cent. There is not the least doubt that the production of the mines could be placed at such a mark as to fully meet every demand of the market if they could be assured of a sufficient car supply.

There are still rumors of some prices around \$4 and \$4.50, but these figures are usually quoted by the smaller and less responsible concerns which evaded going into the price agreement. It may be if there have been any extraordinarily high prices they will be divulged in the near future, as all shippers have now been called upon by the Trade Commission to make a report of all prices charged since Aug. 7. Recently there has been a greater number of offers than ever from owners of new

openings. Usually when these tenders are investigated the shippers ask a high price for the inferior coal of a new operation.

Shipments into Canada are understood to continue in fair volume and in this connection it is interesting to note that the Fuel Controller of Canada has opened a branch office in Pittsburgh to look after the fuel interests of the Dominion in that territory. A good quantity of coal is being sold for foreign Tidewater bunkering, and as a result of all these conditions there is very little spot coal to be had.

BALTIMORE

Bituminous movement confined almost entirely to contract coals. Shipment light due to poor car supply and labor shortage at mines. Hard coal a little easier.

Bituminous—Numerous complications are facing the soft coal trade here. Consumers for the most part are resting content with what coal they can get through on contracts, having found that there is little of the Government maximum coal being offered spot. Poor car movement from most of the soft coal fields, wretched labor supply that is hurting production generally, and the fact that some mines are probably sticking pretty close to a production that will take care of contracts alone, all have effect. Many consumers who have endeavored to place new contracts recently have found an iron wall of replies that mines had no coal to sell. All quote the \$3 to \$3.25 price now but say they have no fuel at any price for the time being. Middlemen in many cases find it as hard as consumers to get coal from mines, and a number have found their tonnage sadly cut down by existing conditions.

The situation at Tide is also confusing. Not only is there continued complaint of local users of pier delivered coal through the Tidewater exchange that the change of fuel is not satisfactory, but a complication has grown up in the hitherto satisfactory bunker and export trade. So much cheap coal was loaded down here on speculation for bunker use that a glut formed on one class designation, and an embargo was slapped on. Then the Government further complicated things by failure to provide bottoms promptly for some Federal fuel, and the terminals here are at present congested with this coal and coal brought down for bunker sales which owners do not wish to let go of in the general market at the agreed maximum.

Anthracite—For the time being anthracite is considerably easier. The past week saw deliveries of more of the schedule coal than for some time past, and at present there is not so much talk of premium paying. Unless troop movements tie up the coal shipments the coal men here are figuring on getting through much of their book business before the close of the present month.

HAMPTON ROADS

Serious congestion at Newport News and Sewalls Point. No activity in coastwise business. Heavy demands by Navy Department. Export and bunker trade brisk.

Shippers over the Chesapeake & Ohio at Newport News and the Virginian at Sewalls Point are encountering long delays in getting their vessels loaded. This is on account of the congestion of vessels and the situation seems to be getting worse instead of better. Valuable steamers, whose time is worth thousands of dollars per day, are spending days at anchor waiting for a berth. The despatch at Lambert's Point is somewhat better, due to the better facilities.

Coastwise business is largely confined to contracts, with an occasional spot sale. The tonnage moving under contract is, however, considerable. It is of interest that the fleet of tugs and barges of the Luckenbach Co., which has been tied up for some months, is again in service in the coastwise trade.

The Navy Department is calling for deliveries in increasing volume. Their demands of course have first call and commercial business has to wait on them.

The foreign trade and bunker business is brisk with no change in prices, which are around \$7 per ton. There are some interesting features in regard to exports, which it is impossible to publish.

Representatives of several shippers are in Washington this week appearing before the I. C. C. in regard to the proposed demurrage tariff of the three coal railroads.

Dumpings at the Hampton Roads piers for the past several weeks were as follows:

	July 21	July 28	Aug. 4	Aug. 11
Nor. & West..	141,310	144,743	121,170	115,925
Ches. & Ohio..	90,993	104,865	81,188	
Virginian.....	96,385	84,236		108,117
Total.....	328,688	333,844		

Ocean Shipping

OCEAN FREIGHTS

During the past week the Dutch steamer "Roepat," 7500 tons, 10 per cent., prompt, was closed to load coal at Baltimore or Virginia to Buenos Aires, and for Montevideo at \$30 per ton, which is considerably less than the last charter to these destinations. This boat was in the market for some time on these terms before fixture was effected.

A number of other charters were completed during this period, but none of them were reported.

Rates to South American ports are easier than a week ago, but to Havana and some other destinations rates are firmer.

We would quote freight rates on coal by steamer as follows:

Europe	Aug. 6	Aug. 13
Marseilles.....	\$100.00 about	\$100.00 about
Spain (Atlantic)*	42.00 about	42.00 about
Spain (Med't'n)*	44.40 about	44.40 about

Note—Charters for Italy, France and Spain read: "Lay days to commence on steamer's arrival at or off port of discharge."

South America		
Montevideo.....	\$33.60@36.00	\$30.00@32.40
Buenos Aires.....	33.60@36.00	30.00@32.40
Rosario.....	36.00@38.40	33.60@36.00
Rio Janeiro.....	*32.00 about	*31.00@32.00
Santos.....	*36.00 about	*35.00 about
Chile (good port).....	16.00@18.00	16.00 about

West Indies		
Havana.....	5.00@5.25	5.25 about
Cardenas, Sagua.....	6.75 about	6.75 about
Cienfuegos.....	7.25@7.75	7.25@7.75
Port au Spain.....	10.00@10.50	10.00 about
St. Lucia.....	10.00@10.50	10.00 about
St. Thomas.....	8.50@9.00	8.50@9.00
Barbados.....	10.00@10.50	10.00 about
Kingston.....	7.50 about	7.50 about
Curacao.....	8.75@9.25	8.75@9.25
Santiago.....	7.50 about	7.50 about
Guantanamo.....	7.50 about	7.50 about
Bermuda.....	7.00 about	7.00 about

Mexico		
Vera Cruz.....	9.00@10.00	9.00@10.00
Tampico.....	9.00@10.00	9.00@10.00

* Spanish dues for account of cargo. * And p.c.
* Or other good Spanish port. * Net.
W. W. Battie & Co.'s Coal Trade Freight Report.

COASTWISE FREIGHTS

Inquiry is better, particularly from Hampton Roads to Boston. \$2.50 now is a firm rate on barges, 1500 tons upwards, and freights are expected to advance. The continued withdrawal of barges to other trades is partly the cause and in addition there is a better inquiry for coastwise coal.

To Long Island Sound ports from New York \$1.25@1.40 is about the range. Small coasters are being chartered at from 25c. @ 50c. less for eastern ports than was the case a fortnight ago.

Lake Markets

PITTSBURGH

Spot market very quiet. Government price fixing regarded imminent. Car shortage continues.

The coal market seems to be gradually dropping out of sight. Consumers assert that they can rarely pick up spot coal, operators say they are selling scarcely anything in the spot market, and brokers explain that large buying orders are offered them but that they cannot find the coal. The suspicions are stronger that there is coal being sold at above the agreed maximum but no specific statements are made. The explanation formerly made is reiterated, that full shipments are being made on old contracts, at above the agreed price, and that this leaves little for the open market.

Since the food bill was enacted last week the opinion is general that the Government will soon fix coal prices. This it would do, of course, even if the prices it considered fair were the prices arranged at the conference late last June, because it would be desirable to fix the prices legally instead of leaving them as the effect of a voluntary agreement. The more common opinion, however, is that the authorities will conclude \$3 is too high a price and will fix prices in the neighborhood of \$2.50.

Car supplies are about the same as formerly, and are somewhat under the ability of the mines to load, but labor is also scarce and a moderate increase in car supplies would probably uncover a labor shortage.

The market remains quotable on the agreed basis, even though not much is

being done: Slack and mine-run, \$3@3.25; screened, \$3.50@3.75, per net ton at mine, Pittsburgh district. Export prices range about 50c. higher.

BUFFALO

Bituminous market upset by reports of a new Government price. Car shortage bad as ever. Anthracite conditions unchanged.

Bituminous—The consumption of all sorts of coal is heavy and the contracts taken last spring were evidently heavier than they were reported to be, as otherwise the amount of free coal on the market would be much more than it is. Jobbers who have a good list of contracts are pleased over what others call their luck. Contracting was not openly popular when coal was so high, but a great many shippers are now depending on them almost entirely and are not worrying over the going price, which is as hard as ever to make out. In fact, it is anything that the courage of the shipper and the needs of the consumer can agree upon.

The offices are again full of rumors as to what is to be done next. One office will send out a report and another will contradict it. All that is really agreed upon is that lower prices are expected. Jobbers say that if the operators had accepted the Government price of \$3 to \$3.50 at the outset as they did the 25c. profit, there would have been no further action, but the operators tried hard to go around the price and also to appoint themselves their own sales agents in order to capture the jobber's profit and now there is prospect of an arbitrary \$2.75 gross price to the consumer at the mines.

All car movements are slow, but embargoes of the Canadian trade are not so numerous as formerly. Still car shortage is expected to increase from this time on.

Bituminous prices are hardly as strong as they were a week ago, the fear of an arbitrary increase of the reduction apparently being the reason for this, as there is no more coal in sight than there was and the consumption is as large as ever. Jobbers' figures still vary considerably. Mine-run coal is practically out of the market, slack selling above it. The favorite size is three-quarter, the half dollar difference between it and slack being maintained pretty well.

Quotations per net ton, f.o.b. Buffalo, are fairly strong as follows:

Slack and lump, Pittsburgh Rate.....	\$4.65@5.15
Slack and lump, Bessemer Rate.....	4.55@5.05
Slack and lump, Allegheny Valley Rate	4.50@5.00
Cambria Co. Smithing, Allegheny Valley Rate.....	5.20@5.70
Pennsylvania Smokeless, Allegheny Valley Rate.....	5.25@5.75
Cannel, Allegheny Valley Rate.....	6.70@7.20

Prices are not varied for different mines or different regions, unless the coal falls into some special class.

Anthracite — The trade continues on about the same level. Shippers pay small attention to the demands of retailers and consumers, as it is impossible to discover who is most in need of coal, except by comparison with the amount taken last year. In this way an even distribution is made pretty certain.

The independent anthracite supply is light. If anyone has direct connection with a mine some coal can be had, but orders sent in by jobbers not so favored are seldom filled, even by the agents of the standard companies.

Lake shipments of anthracite are large, but the custom house now refuses to give any information as to shipments to Canada. The amount exported by water is about 10,000 tons a week. To domestic ports the week's shipments were 118,400 tons, of which 65,700 tons cleared for Duluth and Superior, 18,600 tons for Chicago, 25,300 tons to Milwaukee, 7800 tons to Green Bay and 1000 tons to Racine. Freight rates are unchanged.

TORONTO, CAN.

Anthracite in demand and coming forward freely. Dealers overtaking outstanding orders. Bituminous quieter. Famine scare subsiding. Prices steady.

Anthracite is coming forward freely and dealers are gradually overtaking orders on hand, but local deliveries are still made largely from the cars and there is but little in the yards. The demand for bituminous is not nearly so active, many of the large consumers having laid in stocks, while others are merely buying for immediate requirements. The action of the Coal Commissioner has had a re-assuring effect and the panic caused by fear of a winter coal famine has largely subsided. Retail prices have been steady for some weeks with slightly easier wholesale rates.

Quotations for best grades per short ton are as follows: Retail anthracite egg, stove, nut and grate, \$9.50; pea, \$8.50; bituminous steam, \$9; slack, \$8 to \$8.50;

domestic lump \$9; Cannel \$11; wholesale f.o.b. cars at destination, three-quarter lump, \$7 to \$7.50, slack, \$6.85 to \$7.

CLEVELAND

Car supply only averaging thirty per cent. of capacity of mines. Many vessels forced to go without coal cargoes. Decrease in eastern Ohio production.

The poor car supply at Ohio mines the past week has reduced shipments very materially, a good many mines reporting less than 30% of their capacity. This situation has created a very uneasy feeling among shippers of Lake coal as it has forced many vessels to go up light on account of there not being enough coal at the loading docks to give them cargoes. However, the railroads have promised members of the Lake Erie Bituminous Coal Exchange that from now on till close of navigation they will give Lake coal the preference and will endeavor to increase the car supply to such an extent that shipments to the Northwest will be greatly increased. Unless this is done, there is bound to be a big shortage of bituminous coal on the docks the coming winter.

During the past few days several contracts totaling 100,000 tons of Pittsburgh Number Eight coal have been closed by Eastern Ohio operators at prices ranging from \$2.70 for slack, to \$3.50 for 1½-in. lump per net ton f.o.b. mine.

Shipments of Pittsburgh Number Eight coal from the Eastern Ohio district for the month of July were 1,067,700 tons, showing a decrease of about 100,000 tons, as compared with July, 1916.

Following are the market prices per short ton, f.o.b. Cleveland:

	Three-quarter	Mine-run	Slack
No. 8.....	\$4.40	\$3.90	\$3.90
Cambridge.....	4.40	3.90	3.90
Middle Dist.....	4.20	3.90	3.90
Hocking.....	4.40	3.90	3.90
Youghiogeny.....	4.65	4.15	4.15
Pittsburgh.....	4.65	4.15	4.15
Pocahontas.....		4.85	

TOLEDO

Demand for Lake coal strong. Steam users anxious to get supplies; wholesalers complain of a shortage of steam coal at the mines.

The local market has been given an added impetus by the large steam coal users who, during the past week, have sent out inquiries for stocks in large blocks. The dealers here assert it is impossible to supply the sudden demands of factories and public institutions immediately. Retailers are giving the anthracite situation wide publicity in the newspapers and are urging the people to buy coal now instead of waiting until actual cold weather sets in.

Demand for Lake tonnage is the main feature of the market, and it is beyond the ability of Lake men to satisfy the demands being made upon them for this item. All coal coming into the city for Lake shipment via the C. & O. Ry. is embargoed, while the T. & O. C and H. V. railways by putting restrictions on their equipment confining the cars to their respective lines between this city and the mines, are getting the coal moved to destination promptly. Bottoms are more numerous at this port than they have been in the early part of the season, and shipments are going forward as rapidly as they reach the docks.

An active demand for Pocahontas and anthracite is featuring the domestic market. Most wholesalers report being sold up for the next couple of months on this stock and as a consequence retailers who are not stocked for the winter are making strong efforts to get a supply. Retailers are appealing to the people in the city to buy coal now, assuring them the price is as low as it will ever get and that stocks in most yards are in better condition at this time than they will be later.

Steam users are trying hard to get all the coal they will need during the winter months as soon as possible. A few of the largest users are offering the wholesalers a small amount above the market price for immediate shipment. Very few factories have stocks which will last any length of time. Iron and steel mills in this vicinity along with factories engaged in Government work stand the best chance of getting supplies, according to wholesalers. The city has placed contracts for the coal supply for its institutions and arrangements for its delivery during the latter part of August have been made.

Prices on tons, f.o.b. mines, are as follows:

	Mine run	Lump and Egg	Nut and Slack
Hocking & Pomeroy.....	\$3.25	\$3.75	\$3.25
West Virginia Splint.....	3.25	3.75	3.25
Kentucky.....	3.25	3.75	3.25
Pocahontas.....	3.25	3.75	3.25

DETROIT

Steam coal users hold off on placing orders. Household consumers also appear indifferent. Lake shipments are increased.

Bituminous—With their hopes for lower prices increased by frequent intimations from semi-official sources in Washington that action is about to be taken to effect a reduction in selling prices or bring operation of coal mines under Government direction, a considerable number of the consumers of steam coal continue to maintain an attitude of "Watchful waiting." Buying only sufficient stock for current requirements of their plants, they are delaying effort to accumulate reserves until the lower prices materialize. Meantime jobbers and wholesalers are asking what advantage lower prices will be in case the steam plants are unable to obtain delivery of coal.

Deficiency of transportation facilities, which has been troublesome through the year, in the opinion of the jobbers, is likely to become more pronounced in the near future when the movement of crops gets under way and the railroads are called on, in addition, to handle vast quantities of material for the Government.

The indifference of the domestic coal users, results not only from the hope of cheaper prices but from the relaxation of interest in fuel, customary at this season of the year, when vacations and other affairs, including the operation of military conscription, are engaging attention.

Anthracite—Stocks of anthracite are reported to be much short of the amount that will be needed for winter. Shipments coming to Detroit are light and retailers seem less interested in stocking up than they did early in the year.

Lake Trade—Slow movement of coal from mines to loading docks is still a check on Lake shipments, though the volume of movement is increasing. Vessel capacity is being provided to handle all the cargoes offered, despite the fact that many carriers are being held three or four days at ore-unloading docks to discharge cargoes carried on their downbound trip. Shippers are paying a freight rate of 50c. to the head of Lake Superior and are offering 60c. to fast docks in Milwaukee.

LOUISVILLE

Demand greatly stimulated by prospective eastern Kentucky-Tennessee strike. Consumers will take anything offered. Western Kentucky profits from much stiffer market.

News of the strike plans of coal miners in the eastern Kentucky-Tennessee field has greatly stimulated the demand for coal of every kind, though the flat price regulation eliminated any excitement. Nothing like a protracted closing down of the mines is expected.

Meanwhile, however, western Kentucky operators, with the strike danger removed, began to feel a stimulated demand for coal with numerous inquiries which they could not fill. An improved car supply on the Louisville & Nashville lines is likely and capacity outputs are expected to rule. Western Kentucky prices have already stiffened and it is predicted that they may go to the maximum "Government" scale which has ruled in eastern Kentucky. There are practically no screenings on the western Kentucky market and some of the operators are delivering mine-run on their pea and slack contracts. The retail demand is increasing, now that the better class residence consumers have come to the conclusion that prices will not come down in time to insure them getting their needs supplied before winter.

Western Kentucky quotes lump at \$2.75@3; mine-run, nut and slack, etc., \$2.25@2.50, f.o.b. the mines.

Eastern Kentucky-Tennessee prices are on the \$3 and \$3.50 basis, with selling charges of 25c. added.

CINCINNATI

Demand continues good in all departments of the market, with movement heavy. Uncertainty regarding price regulation has not affected activity.

With a fair car supply, the movement through this market is continuing in heavy volume, operators being able to make shipments more regularly than for some time. This is especially true of the shipments to Lake ports, which bid fair to make a record this season. A sufficient local domestic demand has developed to bring retailers into the market more actively than for some time, and this is bound to increase as the season advances, although persistent reports in the press that lower prices will be fixed by state or federal authorities, and that consumers can get cheap coal later on, have naturally tended to cut down demand.

The call for steam coal is heavy, industrial consumers, with unprecedented business ahead of them, showing a desire

to protect themselves as to their fuel requirements. The supply of labor has so far not been seriously affected by army demands, but when the draft starts this may become a factor, coupled with the gradual loss of men to industries where wages are now at a high level.

BIRMINGHAM, ALA.

Market easy, though demand slightly better than last week. Prices firm, with maximum quotations ruling. Production curtailed by disturbed labor conditions, and also by inadequate car supply in some instances.

Some improvement is noted in inquiries in the local market over last period, buying doubtless being stimulated to some extent by the threatened strike on Aug. 20, though there has been no very noticeable efforts at stocking except on the part of the railroads. Consumers in general do not seem to be very much perturbed over the proposed walk-out of the miners—at least they have attempted little preparation in the way of a fuel supply to tide them over interrupted production. Quotations are being held close around the maximum figures allowed, and there is little surplus coal on the market. Prices are as follows per net ton mines: Black Creek and Cahaba \$3.75@4; Pratt, \$3.50; Corona and Carbon Hill, \$3.25@3.50; Big Seam, \$2.75@3. The trade is confined to spot business and the renewal of old standing contracts.

Operating conditions have changed little, miners working on about the same schedule that they have observed for some weeks, which is not a full and regular one by any means. Complaint has been somewhat general of insufficient car supply, one large mine reporting that it had not had a full complement of cars any day during the week. The L. & N., Frisco and Southern have all been short on equipment. This condition is said to be due in part to the more extensive use of cars for company fuel.

Coke

CONNELLSVILLE

Car supplies slightly better but prices advance. Cost sheets being prepared. Government expected to fix price between \$4.50 and \$6.

Car supplies last week were between 55 and 60 per cent. of ratings, or about 5 per cent. better than the week before. This week has started better and may show an average between 60 and 65 per cent. The market underwent a further stiffening late last week, until \$15 became the regular price for furnace coke loaded in Pennsylvania cars for shipment east. This week, on account of somewhat better car supplies there was a tendency toward weakening on Monday, but Monday night a severe storm visited the whole coke region, doing considerable damage and decreasing the loading on Tuesday, whereby the market tended to stiffen again, leaving it at the same level now as at the close of last week. The highest prices are obtained on coke loaded in Pennsylvania cars, for Eastern shipment, as the B. & O. and P. & L. E. do not allow their cars to go off their own lines and there are many Eastern points not reached by the B. & O. As a result, coke loaded in cars of the other systems will hardly bring more than \$13.50.

The Food Bill, with its price fixing arrangement for coke, was signed by the President last Friday afternoon, and Saturday morning the majority of coal operators received telegrams from the Federal Trade Commission asking for detailed statements of their cost of producing coke in June. Prior to this time the common guess as to the cost would have been about \$2.50, but as operators have studied the matter, with a view to including in cost everything that should be considered, they are finding their costs running up to \$4, and in some cases possibly to \$4.50. The most common guess is that the Government will fix the price at about \$5, a few guesses running down to \$4.50 while others run up to \$6, provided the \$3 coal price is approved, but it is more generally thought that coal will be fixed at less than \$3, perhaps \$2.50.

We quote spot furnace coke at \$13.50@15 and spot foundry at \$14@15.50, per net ton at ovens.

The "Courier" reports production in the Connelleville and lower Connelleville region in the week ended Aug. 4 at 335,073 tons, a decrease of 32,282 tons, and shipments at 323,946 tons, a decrease of 46,672 tons.

Buffalo—Prices have advanced lately and are still strong, the ovens appearing to ask and obtain their own prices, on account of the scarcity of the product. Consumers have no option, as they cannot afford to shut down. Quotations of 72-hour Connelleville

ville foundry are \$16; 48-hour furnace, \$14.50; low grades and stock, \$13. Lake movements have fallen off east-bound, except of iron ore.

Birmingham, Ala.—The coke market is firm with good demand, but a very short supply. About all the producers are able to do is to hold their own and take care of the business already booked. Production is being affected to some extent by the disturbed labor conditions. Spot foundry coke is quoted at \$16.50. Contract \$11.50 to \$14 per net ton ovens, about all this class of business being confined to renewals. Furnace coke is almost unobtainable, the price ranging from \$6 to \$8 per ton ovens.

Middle Western

GENERAL REVIEW

Demand for coal continues strong. Labor and car supply retarding production. Many petty strikes throughout Indiana and Illinois.

The market continues firm regardless of the fact that the consumers of domestic sizes are holding off as much as possible. Industrial concerns and the railroads are not only taking as much coal as their contract requirements call for, but securing all they can on the spot market at the maximum prices. The householders, according to reports from retailers are holding off due no doubt, to the agitation on the part of the newspapers, for lower prices.

Governor Lowden of Illinois has appointed Judge Carter of Chicago to meet with a Committee of Operators and the State Defense Council to settle the controversy relative to prices of Illinois mined coal. An agreement has been made between the governor and the operators that they will be satisfied with whatever price Judge Carter decides upon, and this decision will probably be made within the next 10 days. This will have a tendency to stop the newspaper agitation for lower prices, and create a very heavy demand from the retailers for domestic sizes. Shippers as a rule are accepting orders for future delivery on basis of "price in effect date of shipment."

There has been a number of strikes in the Indiana and Illinois fields which has seriously interfered with shipments. Near Clinton, Indiana, between three and four thousand men have been out for almost one week because they objected to the coaches furnished them by the railroad serving that district. In the Springfield and Standard fields of Illinois more than 7000 men are idle as a result of the strike for higher wages for mule drivers. These men are demanding nine and ten hours' pay for eight hours' work. The present wage scale is \$3.60 for 8 hours' work. Neither of these walkouts have the approval of the miners' organization, and efforts are being made by the union to force the men back to work.

Lake shipments have shown some improvement, and vessel interests assert that they will be able to move the required tonnage up the Lakes provided the coal is available.

CHICAGO

Industrial demand continues strong but demand for domestic coals is less active due to agitation for lower prices. No improvement in car and labor supply.

Industrial concerns in Chicago and vicinity were heavy purchasers of coal the past week, and made up for the lack of buying on the part of retailers who hesitate to store coal in large quantities in the fear that prices may be forced down later. Householders have been holding out in the belief that agitation on the part of the Government will not only reduce prices but increase the available supply.

Railroads in the Northwest have placed some large orders for Central and Southern Illinois coal shipments to be made as rapidly as car supply will permit. The Copper Range country of Michigan also bought heavily of steam sizes at the regular maximum prices.

Retailers are finding it difficult to satisfy demands for anthracite, and shipments have been light by both all-rail and boat. Some complaint is heard, and the anthracite companies are coming in for considerable criticism, due to the feeling that the West is being neglected. Many dealers have the impression that the East is being given the preference and that if anything is left over it will be shipped to the Mid-west. Chicago retailers are unable to stock any of this coal and report their inability to secure sufficient supplies to meet present demands.

In the Franklin County field there was no improvement in the amount of domestic business received the past week over the preceding week. However, demands on the

part of industrial concerns were more than sufficient to make up for the slump on sized coals, and the mines are three to four weeks behind on orders. Car supply averaged around 60 per cent. with a poor supply of labor. At the rate of production for the past week the August tonnage will fall below the 1,000,000 mark which has more than been maintained for the past four or five months.

Williamson County prices are very firm. Demand continues strong, especially on steam sizes. Car and labor supply has been inadequate with work time averaging less than 60 per cent.

The Saline County mines continue to have a bigger demand for steam coal than they are able to furnish with present labor and car shortage. Prices are firm, the Government maximum ruling on all sizes.

A number of mines have been idle in the Springfield district, due to minor labor disturbances which are evidently the result of too much prosperity among a certain class of workmen. Prices have been firm due to the lessened production, and no great amount of lost time has been reported due to insufficient car supply.

The Fulton and Peoria County mines have had a good car supply, and production increased considerably over the preceding week. No change in prices is reported, and mines are booked up from three to four weeks.

Indiana production the past week was seriously hindered by numerous strikes. Mines in the Clinton district were idle most of the week because the men objected to the coaches furnished by the Chicago & Eastern Illinois R.R. Prices have not changed and the Government maximum are ruling in most districts. The demand has continued strong notwithstanding the continued agitation on the part of the press and the Indiana governor for lower prices.

Very little, if any, smokeless coal reached the Chicago market the past week. Retailers report more difficulty than ever in securing shipments and shippers are making no promises. Car supply in Eastern fields has been poor and the demand from the East has been more urgent than ever. Considerable quantities of this coal is moving up the Lakes at prices reported to be above the Government maximum.

Very little Hocking and New River coals are arriving in Chicago. Lake demands and the local consumption seem to be absorbing the entire production that the short labor and car supply will permit.

Due to the threatened miners' strike in Eastern Kentucky the demand for these coals has been greater than ever. There has been no change in price and Government maximums are in effect. Very little of this coal is reaching this market.

Quotations in the Chicago market are as follows, per net ton, f.o.b. cars at mines:

	Springfield	Fulton and Peoria Cos.	Clinton and Sullivan Cos.	Green and Knox Cos.	Carterville
Domestic lump.....	\$3.25@3.50	\$3.25@3.50	\$3.50	\$3.25@3.50	\$3.50
Steam lump.....	3.00@3.25	3.00@3.25	3.00@3.25	2.75@3.25	3.25@3.50
Egg.....	3.25@3.50	3.25@3.50	3.50	3.25@3.50	3.50
Nut.....	3.25@3.50	3.25@3.50	3.50	3.25@3.50	3.50
Mine-run.....	2.75	2.50@2.75	2.75	2.25@2.75	2.75
Screenings.....	2.75	2.25@2.50	2.75	2.25@2.75	2.75
	Williamson and Franklin Cos.	Saline and Harrisburg	Poca. and W. Va. Smokeless	Penna. Smokeless	Eastern Kentucky
Lump.....	\$3.50	\$3.50	\$3.75	\$3.75	\$3.75
Egg.....	3.50	3.50	3.75	3.75	3.75
Nut.....	3.50	3.50			3.75
No. 1 nut.....	3.50	3.50			
No. 2 nut.....	3.50	3.50			
No. 3 nut.....	3.25@3.50	3.25@3.50			
No. 1 washed.....	3.50	3.50			
No. 2 washed.....	3.50	3.50			
Mine-run.....	2.75	2.75	3.25	3.25	3.25
Screenings.....	2.75	2.75			3.25
Hocking Lump \$3.75		Splint Lump \$3.75			

MILWAUKEE

Coal consumers agitated over insufficient supplies. Prices considered exorbitant. Wisconsin Council of Defense urges Government control of mines. Governors to confer at Chicago.

Gov. E. L. Philipp of Wisconsin is determined that there shall be an immediate solution of the coal problem, and to that end has offered the cooperation of himself and the Wisconsin Council of Defense with the governors of Ohio, Indiana and Illinois in an effort to secure reductions in price and assurance of sufficient supplies for the coming winter. A conference was held in Chicago on Aug. 16.

Under present conditions, Gov. Philipp avers, many dealers are unwilling to stock up, and the result is that supplies are coming forward alarmingly slow. On the other hand, consumers are obsessed with the belief that the coal supply is being

purposely hampered and that they are victims of a combination. In this conclusion they are supported by the Wisconsin Council of Defense, which, in submitting its findings to the authorities at Washington, urges government control of the coal mines on the ground that the public is being held up on prices. Nothing but official action, such as is contemplated by the coming conference of governors, will clarify the situation.

Agitation over the coal situation has reached an acute stage and the press is taking up the cudgel for consumers. It has been suggested that the Attorney-General of the state be urged to institute proceedings under the Wisconsin anti-trust law in order to lay bare the methods pursued in the marketing of coal. Dealers insist that nothing can be gained by any such action and that the remedy for irregularities, if any exist, lies wholly in the hands of the Federal authorities.

While it is generally accepted that dealers in the West have little to say as to the price of anthracite, the recent investigation by the Wisconsin Council of Defense revealed methods of price fixing on other varieties of coal which representatives of the large dock companies at Milwaukee were unable to explain. These facts will receive consideration by the governors and also by the authorities at Washington.

In view of the attitude of the consuming public, dealers here think a mistake was made in enforcing an increase of 10c. per ton on anthracite on the first of August, and they so informed the Eastern companies. The price of coke is also regarded as abnormally high, but as the supply is limited to the output of two by-product corporations there is little prospect of a reduction.

The shortage of anthracite is more apparent in the smaller towns of the state, which have had to suffer because of the absorbing demand in Milwaukee. It is freely admitted by coal men that unless there is a marked increase in receipts the docks in Milwaukee will be bare of anthracite at the close of navigation.

As soon as the specifications can be formulated, bids for 70,000 tons of coal for the various departments of the City of Milwaukee will be advertised for by the Central Purchasing Board.

KANSAS CITY

Kansas City is taking domestic coal in moderate quantities for the season, prices remaining steady. Operators are fearful of the prospects when the usual late August demand develops. Present production shows no sign of increasing, and the coming demand will doubtless far exceed the supply. Most steam users are getting coal, though some are complaining of quality and also of the inability of operators to fill contracts.

County sold retail from 25c. to 50c. above Mt. Olive. The price asked today is \$1.50 above.

In the high-grade field fairly good working time was obtained during the past week on all roads, about 60 per cent. full time. There is more free coal from this territory offering at the present time than for several months, which would indicate that there has been a general laying off of purchasing from this field throughout the entire Middle West.

The circular price of \$3.50 is being maintained by some of the shippers but coal has been offered as low as \$3 for the domestic sizes at the larger reconsigning points, like St. Louis and Chicago, and demurrage coal in Chicago has brought less. Practically the entire Mt. Olive field is tied up by a strike, and the tonnage is extremely light and nothing is offered on the open market. It is problematic as to when this trouble will be over. There is considerable uneasiness here over the action of some of the shippers in the Mt. Olive field, who it now develops have been supplying the Omaha and Western markets with domestic coal at a \$3 price when they have been advising their local trade that they had no cars, and that the cars were being loaded with railroad coal. It is understood that some operators in this field have deliberately passed up the loading of restricted equipment which would bring the low price and loaded the foreign equipment for the outside territory at the higher price. Several companies did this last winter, and it almost caused a coal famine in St. Louis at different times.

In the Standard field there is the usual activity, although prices are rather weak and the coal has been sold as low as \$2.10 at the mine for 2-in. lump, and screenings at from \$1.75 to \$2. There is considerable railroad coal being loaded in this field and everything indicates higher prices with the slightest increase in the demand.

The Illinois Central mines are in a deplorable condition, some of them working but one day a week. The commercial mines are losing their men, the latter going to mines that are loading railroad coal and working every day.

There is practically no Eastern coal coming in now at all, only a little anthracite occasionally and a car or two of smokeless. The Arkansas tonnage has dropped off entirely now. It is expected that the Attorney General of the state will hold a hearing here the coming week, pertaining to the alleged fixing of prices by shippers. His representatives are now collecting data.

Many of the retailers are refusing to accept orders of any kind. With Standard coal at \$2.50 for the better grades of lump, and a freight rate of 72c., a delivery charge of 75c., and 25c. for shrinkage, a total of \$4.22, the sale price is \$4.25, though some dealers are managing in some way to sell it at \$4, and for that reason the retail business is almost at a standstill.

The prevailing circular f.o.b. mine, per net ton is:

	Williamson and Franklin Co.	Mt. Olive and Staunton	Standard
6-in. lump.....	\$3.25@3.50	\$2.25@3.00	\$2.75@3.00
3x6-in. egg.....	3.25@3.50	2.25@3.00	2.75@3.00
2x3-in. nut.....	3.25@3.50	2.25@3.00	2.75@3.00
No. 2 nut.....	3.25@3.50	2.25@3.00	
No. 3 nut.....	3.00		
No. 4 nut.....	3.00		
No. 5 nut.....	2.50		
2-in. screen.....	2.50	2.00@2.25	1.85@2.00
2-in. lump.....			2.10@2.40
3-in. lump.....		2.25@3.00	
Steam egg.....	3.25	2.25@3.00	2.15@2.25
Mine run.....	2.50	2.25	2.00
Washed			
No. 1.....	3.25@3.50		
No. 2.....	3.25@3.50		
No. 3.....	3.00		
No. 4.....	3.00		
No. 5.....	2.50		

Williamson and Franklin County rate is 87c. Other fields, 72c.

General Statistics

LAKE SHIPMENTS

Shipments through the Sault Ste. Marie Canals, for June of this year and last year, were as follows, in net tons:

	1916	1917
Hard.....	264,377	327,146
Soft.....	1,791,047	1,796,418

NORFOLK & WESTERN

Destination of shipments over this road for June and the first six months of last

Unusually dull market due to newspaper agitation. Movement of all coal extremely slow and buying has almost stopped. Mt. Olive field tied up by strikes. Car shortage more acute. Country buying slow, and no Eastern coals.

The market continues a source of anxiety to those who have to meet the demand for coals later. The local newspapers are agitating lower prices on coal and advising the public, not to buy. But even with the falling off in orders there is no surplus of Standard coal.

Mt. Olive shipments are three to four weeks behind, and the only available coal offered in any quantity is Williamson and Franklin County. This coal is so high, and the retail price is so unreasonable in comparison with the middle- and lower-grade coals that the public will not buy. In the past Williamson and Franklin

year and this year were as follows, in short tons:

Coal	June		Six Months	
	1916	1917	1916	1917
Tidewater				
Foreign	419,327	205,105	1,727,232	1,216,094
Con'wise	279,285	258,481	1,849,825	1,599,030
D'm's't'e	2,378,703	2,520,063	13,548,892	13,575,217
Coke				
Foreign	3,282		33,351	16,844
Domestic	163,564	191,757	1,035,399	1,191,196
Total	3,244,161	3,175,406	18,194,699	17,598,381

COAL MOVEMENT

Fuel shipments over 13 leading Eastern carriers for May and 5 months of 1916-17 were as follows, in short tons:

Classes and Railroads	May		5 Months	
	1916	1917	1916	1917
Anthracite:				
Baltimore & Ohio	78,194	155,728	678,329	832,903
Buffalo, Rochester & Pittsburgh	20,024	22,105	79,989	95,440
Buffalo & Susquehanna	289	261	2,913	2,293
Chesapeake & Ohio	748	925	4,580	4,494
Erie	738,326	1,027,779	4,085,655	4,531,507
Huntingdon & Broad Top Mountain	124	186	259	406
Pennsylvania	957,091	944,341	4,951,149	4,708,740
Pittsburgh & Lake Erie	124	853	381	1,255
Pittsburgh, Shawmut & Northern	438	502	5,267	5,249
Virginian	460	235	1,153	1,864
Western Maryland	24,962	72,756	140,018	216,278
Total	1,820,780	2,225,671	9,949,693	10,400,429
Bituminous:				
Baltimore & Ohio	3,103,443	3,165,253	14,395,909	14,493,652
Buffalo, Rochester & Pittsburgh	670,352	886,582	3,885,304	3,994,503
Buffalo & Susquehanna	94,934	145,320	599,223	622,480
Chesapeake & Ohio	2,544,094	2,294,642	11,251,575	10,327,225
Erie	637,421	664,018	3,893,257	3,613,535
Huntingdon & Broad Top Mountain	79,496	134,164	493,380	630,394
New York Central (Buffalo and East)	590,354	692,068	3,445,089	3,534,188
Norfolk & Western	2,811,849	2,651,734	12,499,519	11,810,608
Pennsylvania	3,926,050	4,681,032	20,524,490	21,753,013
Pittsburgh & Lake Erie	714,573	943,864	4,464,193	4,474,228
Pittsburgh, Shawmut & Northern	259,154	94,772	1,229,460	656,514
Virginian	409,308	644,856	2,219,358	2,750,803
Western Maryland	607,274	639,208	2,231,768	3,809,648
Total	16,449,302	17,637,513	82,132,534	82,470,791

THE CHESAPEAKE & OHIO

Comparative statement of coal and coke traffic from New River, Kanawha and Kentucky districts for the month of June, 1917-16 and the first six months in short tons:

To	June		Six Months	
	1917	1916	1917	1916
Tidewater	427,199	445,551	3,013,407	2,694,206
East	212,196	169,672	1,470,252	1,382,036
West	1,500,116	1,544,229	7,240,227	8,312,710
Company's				
Fuel	160,965	154,323	1,144,525	1,239,326
From Connections	175,362	221,353	917,212	1,243,428
Total	2,475,838	2,535,128	13,785,623	14,871,706
Anthracite	995	1,828	5,489	6,418
Total	2,476,833	2,536,956	13,791,112	14,878,124
Coke	41,035	40,351	259,341	275,966

Foreign Markets

GREAT BRITAIN

July 19—There has been no appreciable improvement in the inquiry for coals. Stocks are accumulating, and it is now becoming a matter of urgency to check further increase, so as to avoid stoppages at collieries.

Fixed regulation prices now are:

Best Welsh steam	\$7.92
Best seconds	7.56
Seconds	7.38
Best dry coals	7.20
Best Monmouthshires	7.20
Seconds	6.96
Best Cardiff smalls	5.52
Cargo smalls	4.80

The prices for Cardiff coals are f.o.b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f.o.b. Newport, both net, exclusive of wharfage.

Freights—Conditions in outward markets practically unchanged. The demand for tonnage shows no falling off.

Gibraltar	\$21.60	Port Said	\$34.80
Marseilles	21.54	Las Palmas	18.00
Genoa	24.30	St. Vincent	19.20
Naples	23.58	River Plate	27.00
Alexandria	40.80		

I. C. C. Decisions

Investigation and Suspension Docket No. 917. Washed coal weights. Submitted Jan. 6, 1917. Decided June 4, 1917.

Proposed rule providing for the collection of charges on washed coal, in carloads, from Alabama mines to points in the south and west, on basis of actual net weight ascertained at points of shipments found not justified, and suspended tariff required to be canceled.

No 8971. Diana Paper Co. vs. Pennsylvania R.R. Submitted Nov. 11, 1916. Decided June 6, 1917.

Rate of \$2.10 per long ton on coal from certain mines in Pennsylvania on the Penn-

	May		5 Months	
	1916	1917	1916	1917
	78,194	155,728	678,329	832,903
	20,024	22,105	79,989	95,440
	289	261	2,913	2,293
	748	925	4,580	4,494
	738,326	1,027,779	4,085,655	4,531,507
	124	186	259	406
	957,091	944,341	4,951,149	4,708,740
	124	853	381	1,255
	438	502	5,267	5,249
	460	235	1,153	1,864
	24,962	72,756	140,018	216,278
Total	1,820,780	2,225,671	9,949,693	10,400,429
Bituminous:				
Baltimore & Ohio	3,103,443	3,165,253	14,395,909	14,493,652
Buffalo, Rochester & Pittsburgh	670,352	886,582	3,885,304	3,994,503
Buffalo & Susquehanna	94,934	145,320	599,223	622,480
Chesapeake & Ohio	2,544,094	2,294,642	11,251,575	10,327,225
Erie	637,421	664,018	3,893,257	3,613,535
Huntingdon & Broad Top Mountain	79,496	134,164	493,380	630,394
New York Central (Buffalo and East)	590,354	692,068	3,445,089	3,534,188
Norfolk & Western	2,811,849	2,651,734	12,499,519	11,810,608
Pennsylvania	3,926,050	4,681,032	20,524,490	21,753,013
Pittsburgh & Lake Erie	714,573	943,864	4,464,193	4,474,228
Pittsburgh, Shawmut & Northern	259,154	94,772	1,229,460	656,514
Virginian	409,308	644,856	2,219,358	2,750,803
Western Maryland	607,274	639,208	2,231,768	3,809,648
Total	16,449,302	17,637,513	82,132,534	82,470,791

sylvania Railroad to Harrisville and New-ton Falls, N. Y., not shown to be unreasonable or unduly prejudicial. Complaint dismissed.

Investigation and Suspension Docket No. 774. Bituminous Coal to Central Freight Association Territory. Submitted June 15, 1917. Decided July 13, 1917.

These cases, consolidated for hearing, involve: (1) the reasonableness and non-discriminatory character of rates on bituminous coal from the Ohio mining districts to that portion of central freight association territory which is described and delimited in the report as "affected" territory; (2) the reasonableness and nondiscriminatory character of rates from the Ohio mining districts and from districts in Pennsylvania, Maryland, West Virginia, Virginia, Kentucky and Tennessee, collectively referred to in the report as the "Crescent," to certain interior cities in Michigan; (3) the propriety and reasonableness of increased rates proposed to be made effective from the Crescent to affected territory; (4) the proper relation of the rates, or the measure of the differential, to be observed between the rates from the Ohio and "Inner Crescent" districts to affected territory; (5) the proper relation of rates, or the measure of the differential, to be observed between the rates from the Connellsville district in Pennsylvania and the Pittsburgh and other competitive districts in Pennsylvania; (6) the question whether or not the rates from the Pocahontas district in West Virginia to Canton, Ohio, should be the same as to Cleveland, Ohio.

Upon consideration of all the facts of record, Held:

This report also embraces the following complaints: No. 7662, Grand Rapids Association of Commerce et al. vs. A. R. R. Co. et al.; No. 6951, Kellogg Toasted Corn Flakes Co. vs. M. C. Ry. Co. et al.; No. 7089, Jackson Chamber of Commerce vs. A. R. R. Co. et al.; No. 7371, Battle Creek Chamber of Commerce et al. vs. B. & O. R. R. Co. et al.; No. 7667, Jackson Chamber of Commerce vs. P. & L. E. R. R. Co. et al.; No. 7668, Battle Creek Chamber of Commerce et al. vs. Pa. Co. et al.; No. 7669, Cartercar Co. et al. vs. G. T. Ry. Co. et al.; No. 7422, Cartercar Co. et al. vs. K. & M. Ry. Co. et al.; No. 9117, Sunday Creek Coal Co. vs. H. V. Ry. Co. et al.; No. 9137, Pittsburgh Vein Operators' Association of Ohio et al. vs. B. & O. R. R. Co. et al.; and No. 9149, Black Diamond Co. et al. vs. H. V. Ry. Co. et al.

1. That the rates under attack from the Ohio districts to affected territory are not unreasonable, unduly preferential, or prejudicial.

2. That the rates under attack from the Ohio and Crescent districts to the interior cities in Michigan are not unreasonable, but that they are unduly prejudicial against the interior Michigan cities and unduly preferential of Toledo, Ohio.

3. That the respondents have sustained the burden cast upon them by the statute to justify the proposed rates from the Crescent to affected territory, and from certain districts in the Crescent to Columbus, Ohio.

4. That the adjustment of rates on bituminous coal, based upon a differential of 25 cents per ton between the rates from the Ohio and inner Crescent districts to affected territory is, and for the future will be, unduly prejudicial to the Ohio districts and unduly preferential of the inner Crescent districts to the extent that the differential between the said Ohio and inner Crescent districts is less than 40 cents per ton, and that for the future it will be unduly prejudicial to the inner Crescent districts and unduly preferential of the Ohio districts to the extent that said differential is more than 40 cents per ton.

5. That (a) the rates from the Connellsville district should not exceed the rates from the Pittsburgh district to the portion of central freight association territory described in the report; (b) that the Connellsville district is not entitled to as low rates as the Pittsburgh district to that portion of affected territory described in the report as the Valleys and the Cleveland territory, but that the rates from the Connellsville district to Youngstown, Ohio, and points taking the same rates and to Cleveland, Ohio, and certain other points should not exceed the rates contemporaneously in effect from the Pittsburgh district by more than 8 cents and 6 cents per ton, respectively.

6. That the proposed rates from the Pocahontas district to Canton, Ohio, on the same basis as Cleveland, Ohio, have been justified.

7. That in determining the reasonableness of increased rates under a general group adjustment, in which a number of carriers participate, consideration should be given to the several lines serving the group, not alone to the line having the most favorable financial condition or which can handle the traffic at the lowest expense.

8. That the gradual extension of the Pittsburgh basis of rates to the later developed and more remote districts of the inner Crescent has been without proper consideration of transportation conditions or costs and has resulted in undue prejudice to the Ohio districts.

9. That in a proceeding of investigation and suspension, the general public has an interest; and the fact that respondents during a proceeding of investigation and suspension shift their original ground of justification is not material. The Commission must give consideration to all the material facts of record.

10. That respondents in readjusting their rates in conformity to the holdings herein may not increase any discriminations now existing by reason of fourth section departures in respect of which the Commission has entered no order.

11. That reparation must be denied.

No. 8807. Arlington Cotton Oil Co. vs. Central of Georgia Ry. Portions of Fourth Section Applications Nos. 972, 1530, 1573, 1952, 2379 and 3692. Submitted July 24, 1916. Decided June 12, 1917.

1. Present rates on coal in carloads from certain points in Alabama and Kentucky to Arlington, Ga., not shown to be unreasonable or unduly prejudicial. Complaint dismissed.

2. Fourth section relief denied.

No. 9118. Sunderland Brothers Co. vs. Chicago, Burlington & Quincy R.R. Submitted Nov. 17, 1916. Decided June 9, 1917.

Following Reeves Coal Co. v. C. M. & St. P. Ry. Co., 37 I. C. C. 707, defendant's failure properly to advise complainant as to the route traversed by a carload of coal from Christopher, Ill., to Purdin, Mo., and defendant's subsequent failure strictly to observe the terms of complainant's re-consigning order; Held, Not to be a violation of the act to regulate commerce. Complaint dismissed.

No. 6917 and 6917 (Sub-Nos. 1 to 5). Hayden Bros. Coal Corporation vs. Denver & Salt Lake R.R. Submitted Apr. 6, 1917. Decided June 20, 1917.

Divisions prescribed of joint rates on bituminous coal from Oak Hills, Colo., and points taking the same rates, to stations in Kansas, Nebraska, Missouri, and South Dakota on the Atchison, Topeka & Santa Fe Ry., the Missouri Pacific Ry., and the Chicago & North Western Ry.